Volume XX.
Number 4.

APRIL, 1901.

$3.00 Per Year,
Including Directory.
20 Cents Per Copy.

RECEIVED

TEXTILE WORLD,

and Industrial Record.

Questions and Answers.

This Department is of special interest this month. Subscribers are invited to make free use of it, when wanting any textile information.

TABLE OF CONTENTS, - - - - Page 643
CLASSIFIED INDEX FOR BUYERS, - - Page 743

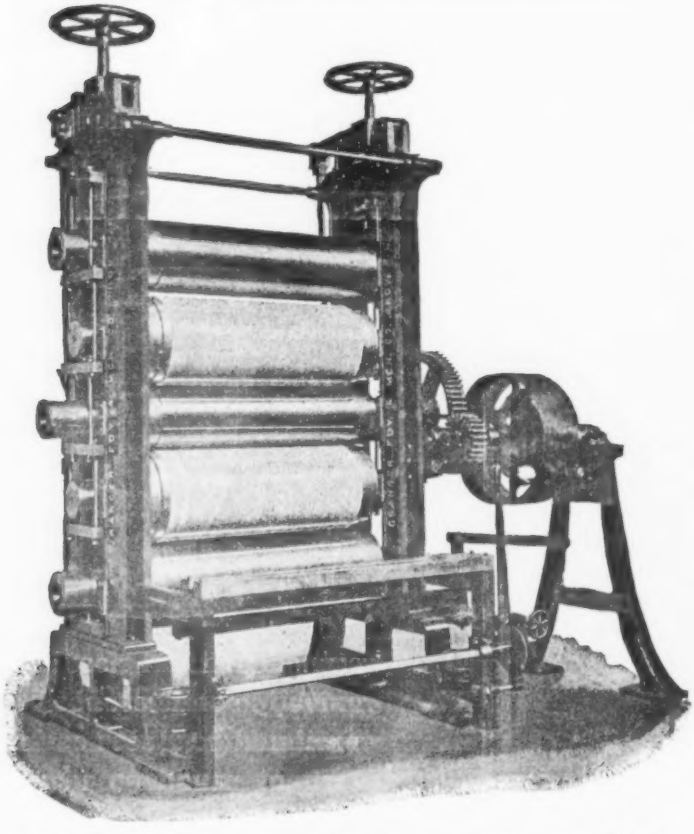
GUILD & LORD,
PUBLISHERS.

620 ATLANTIC AVENUE,
BOSTON, MASS.

The May number of the Textile World will be a Special Cotton Number and contain full reports of the Cotton Manufacturers' Meeting.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

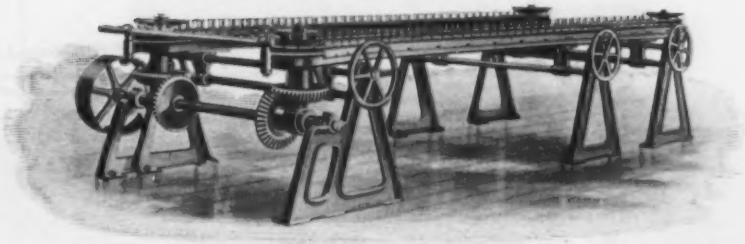
TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

Bleaching, Printing, Dyeing and Finishing Machinery

For Textile Fabrics.



STRAIGHT TENTERING MACHINE, WITH AUTOMATIC CLAMP. (Patented.)

TENTERING MACHINES.

VIBRATORY (or Swiss) MOTION FOR LAWNS, ETC.

RETURN (8, 10 or 12) returns FOR WORSTED AND WOOLEN GOODS.

HOT AIR (2 or 4 returns) FOR GINGHAMS, ETC.

AUTOMATIC CLAMPS (Patented). SPRING CLAMPS. PIN CHAINS.

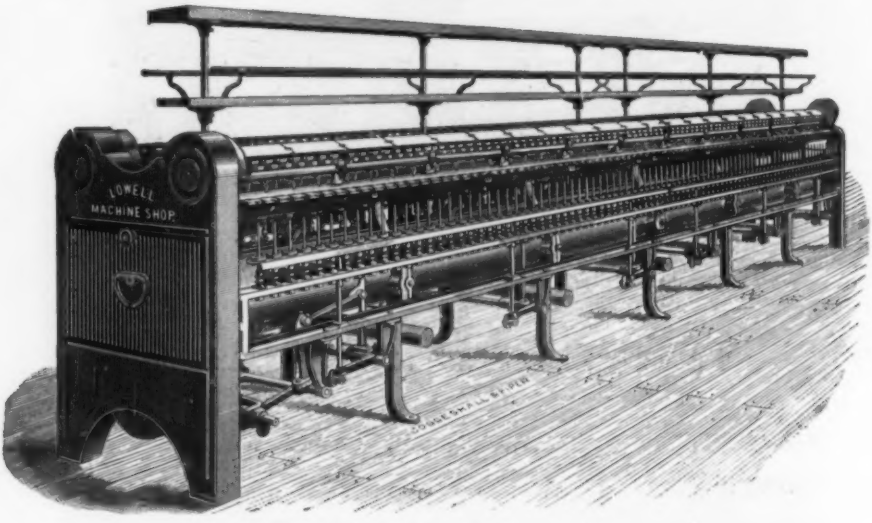
H. W. BUTTERWORTH & SONS CO.,

PHILADELPHIA, PA.

LOWELL MACHINE SHOP,

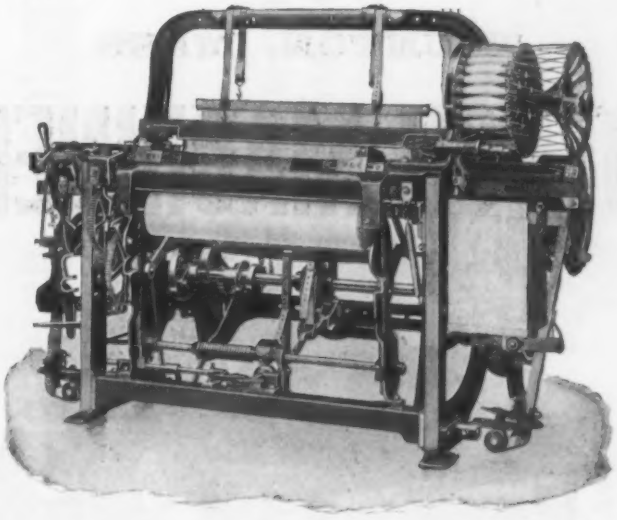
Lowell, Mass.,

COTTON MACHINERY.



Revolving Flat Cards,
Railway Heads,
Drawing Frames,
Roving Frames,
Ring Spinning Frames,
Twisters, Spoolers,
Warpers, Slashers,
Looms.

WORSTED MACHINERY.



OUR LATEST

NORTHROP LOOM

Although our order list lengthens and strengthens, we do not adopt the simple and inexpensive plan of building without change, but continually add improvements whenever possible. A careful study of the above illustration will prove of interest to adepts in the Art of Weaving.

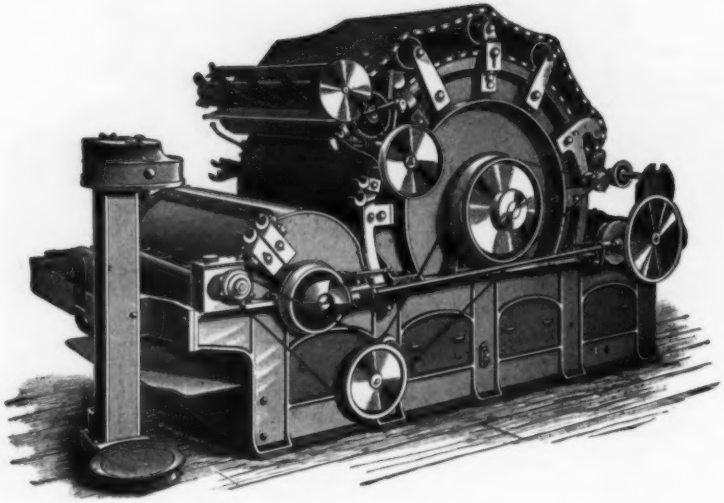
THE DRAPER COMPANY,

Hopedale, Mass.

MASON MACHINE WORKS,

TAUNTON, MASS.

COTTON MACHINERY



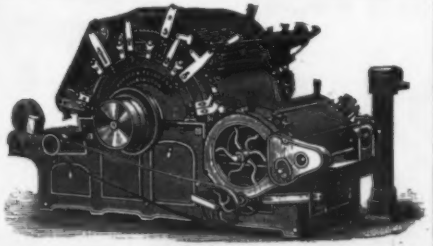
Cards, Combers, Lappers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING THE

Mason-Northrop Loom.

SOUTHERN AGENCY:

D. A. TOMPKINS CO., Charlotte, N. C.



HOWARD & BULLOUGH

American Machine Company,

LIMITED,

PAWTUCKET, - R. I.

Boston Office, 281 Congress St.

Revolving Flat Cards.

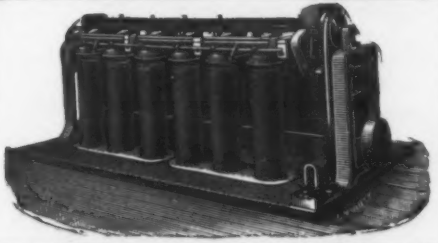
The Simplest and Most Accurate. Greatest Production. Best Quality. Least Waste.

OVER 16000 WORKING.

Electric Stop-Motion Drawing.

The quality of the sliver produced cannot be surpassed. Waste, "single" and roller laps are prevented, production increased, and great saving effected.

OVER 56,000 IN OPERATION.



Bale Breakers. Feeders,

Combined Self-Feeding Openers,

Breaker and Finisher Lappers,

All made from entirely new patterns and containing many valuable patented improvements.

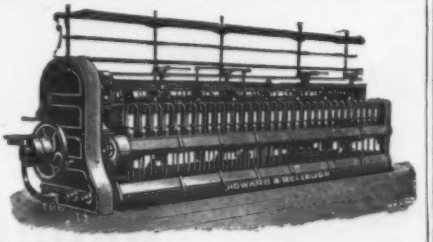
Slubbing, Intermediate, and Roving Machines.

New patented Differential motion, New Arrangement of Cone Drums, New System of Balancing top or bobbin rail, etc.

SPINNING FRAMES, CONE WINDERS,
TWISTERS, WARPERS AND SLASHERS.

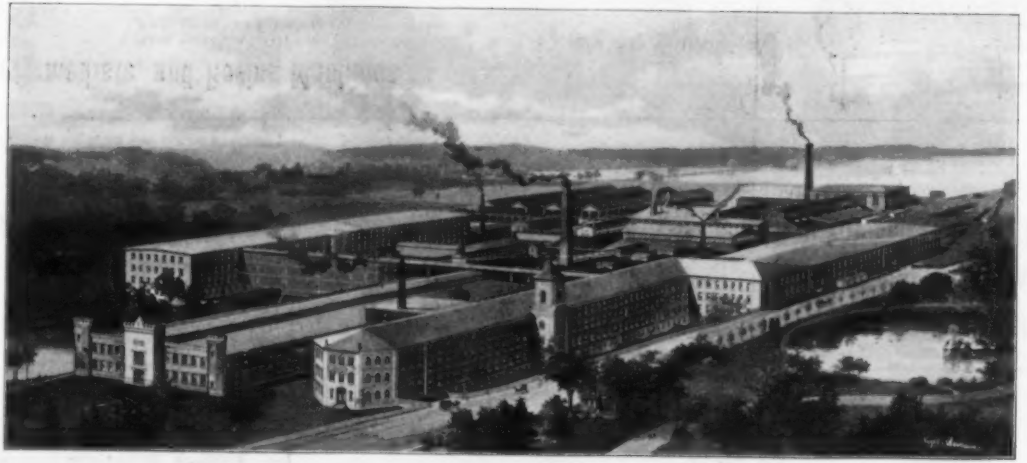
All parts of above machines are made by special tools and are exact duplicates.

We Invite Investigation and Comparison.



THE WHITIN MACHINE WORKS,

Whitinsville, Mass.



COTTON MACHINERY

Revolving Flat Carding Engines.

Sliver Lap Machines.

Ribbon Lap Machines.

Combers.

Railway Heads.

Drawing Frames.

Spinning Frames.

Spoolers.

Twisters.

Reels.

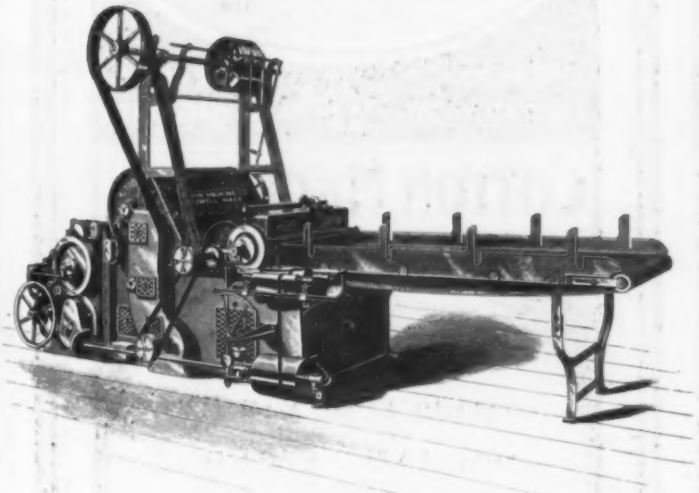
Long Chain Quilling Machines.

Looms.

Southern Agent, S. W. CRAMER, 38 So. Tryon St., Charlotte, N. C.

The Best Pickers.

In the Cotton Field nothing equals the
DARKEY COTTON PICKER.



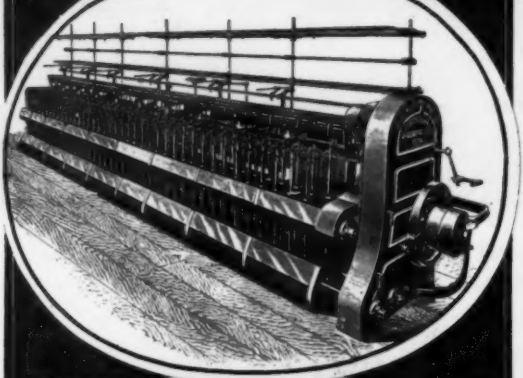
In the Cotton Mill nothing equals the
KITSON COTTON PICKERS.

KITSON MACHINE CO., Lowell, Mass.

Largest Builders of Cotton Openers and Lappers in the World.

H·G·McKERROW·&·CO·

DRAWING FRAMES · SPEED FRAMES
· CARDS · · MULES ·



COMBERS · · FLYERS ·
CARD CLOTHING · WASTE MACHINERY

COTTON MACHINERY

WRITE FOR PRICES — TELEPHONE 1729 BOSTON

Sole American Agents for
TWEEDALES & SMALLEY,
Card Room Machinery.
TAYLOR LANG & CO. LTD.,
Self Acting Mules.
WILLIAM RYDER,
Flyers
C. CAIN, SON, & GREENWOOD,
Card Clothing of all Kinds
MONFORT'S COMBER.
Cotton Combers for
Short Staples.

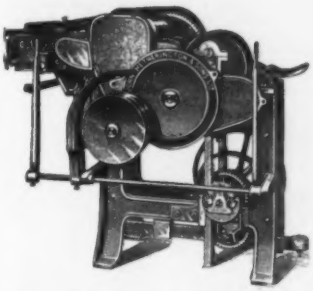
WORTHINGTON BLDG. 31 STATE ST., BOSTON MASS.

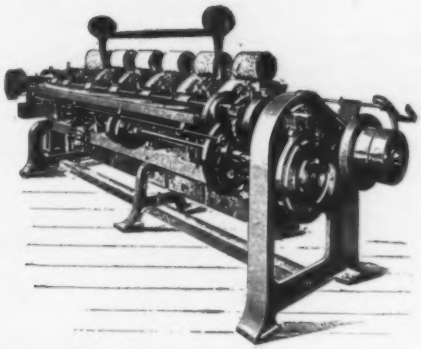
JOHN HETHERINGTON & SONS, LD.

Manchester: England,

——MAKERS OF ALL KINDS OF——

Machinery for Preparing, Spinning, Doubling Cottons, Cotton Waste, Woolen, Etc.

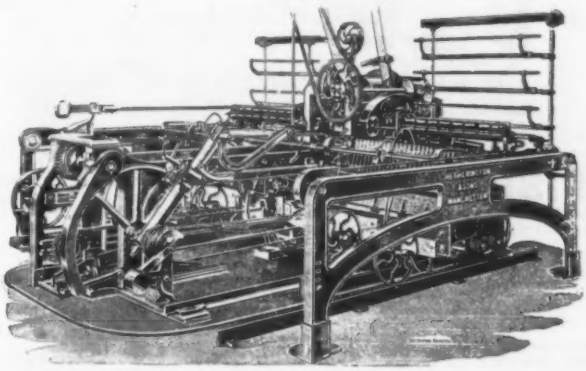




Sliver Lap Machines
with Self Acting Stop Motion.

Ribbon Lap Machines
with six Laps behind for preparing Laps for Combing Machines, made to suit any width of Laps required.

Combing Machines,
single and double Nip for six or eight heads, to take Laps from 7 1-2 in. to 10 1-2 in. wide. Patent Stop Motions for stopping Machine, when delivering too light Slivers, or after any required length has been delivered.



Patent Self Acting Mules (Hetherington and Curtis Patterns of Headstock) for coarse, medium and fine yarns.

Over Three Million Spindles at Work in the U. S.

SOLE IMPORTER FOR UNITED STATES AND CANADA.

STEPHEN C. LOWE, 41-42 BREWER BUILDING, 186 DEVONSHIRE ST. **Boston, Mass.**

THE FISHER CARD FEED

for WOOL, SHODDY, and COTTON, is

Second to None

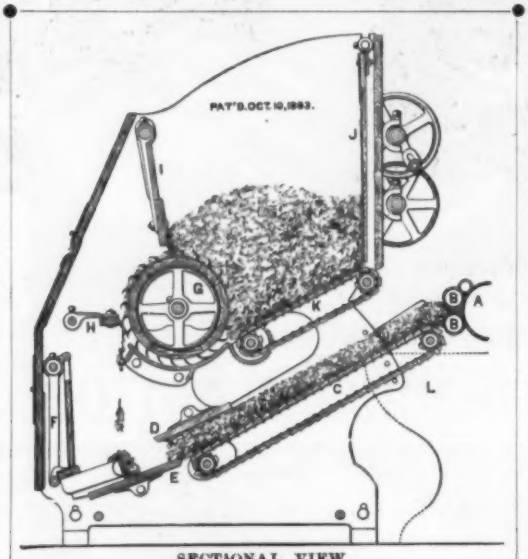
on the market. It holds more stock, requires less space, and needs no "attachments."

WOONSOCKET WORSTED MILLS,
Spinners of Worsted Yarns. Mixes and Fast Colors Specialties.
Boston Office, 570 Atlantic Avenue.

WOONSOCKET, R. I., March 4, 1896.

Messrs. Woonsocket Machine and Press Co., City,

GENTLEMEN—In answer to your inquiry of to-day as to how we like the FISHER FEEDS would say that, after running one for three months and having put in four more since, is sufficient evidence that we consider the Fisher Feeds the best in the market to-day, and you are at liberty to bring any interested person into our mill to see them running and judge for themselves. Yours truly, WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent.



SECTIONAL VIEW.

THE FISHER CARD FEED is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.
It is built in all sizes and guaranteed as represented.

STAR WORSTED COMPANY,
Worsted Yarns.
C. T. Crocker, Pres. C. B. Smith, Treas.

FITCHBURG, MASS., March 4, 1896.

Woonsocket Machine and Press Co.,

GENTLEMEN—We have the pleasure to inform you that the two FISHER CARD FEEDS are working to our entire satisfaction, giving good results on both long and short wools.
Yours respectfully, STAR WORSTED COMPANY,
(Second order.) A. GARTH, Supt.

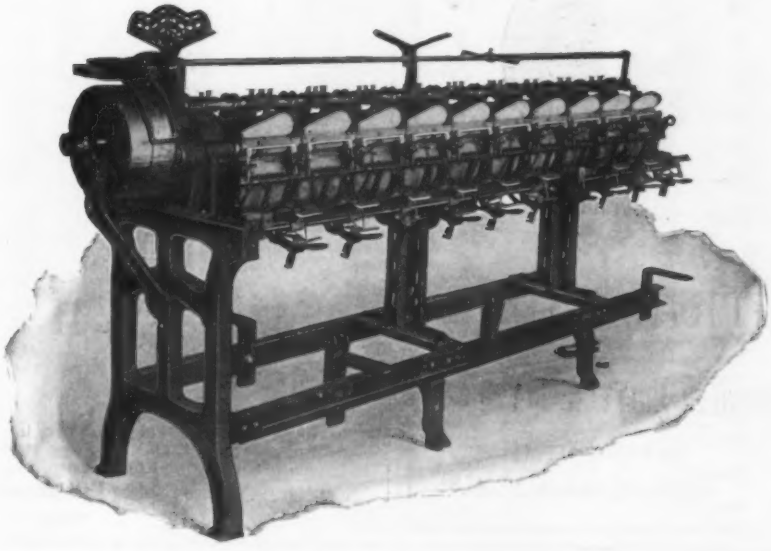
MANUFACTURED BY

Woonsocket Machine and Press Co.,

WOONSOCKET, R. I.

Foster Machine Co.,

WESTFIELD, MASS.



The "1900" WINDER.

Patented in United States and Europe.

.. .. The New Winder. .. ..

This Cone Winder is the fastest running Winder in the market. Gives the greatest production and makes the best shaped Cones in the World.

No Oil or Dirt Can Get on the Yarn.

Has independent drive for rolls.

Even tension and speed. Less power to run.

Stop Motion acts when a thread breaks or runs out.

Before You Purchase

Any Cone Winders please allow us to refer you to some of our best and most reliable people, and send you descriptive circulars.

MORLEY RING

SPINNING TWISTING

TRAVELERS

MORLEY BUTTON M'F'G CO.,

68 Essex Street,

BOSTON, MASS.

BIRCH BROS.,

Somerville, Mass.

Mill Sewing Machines.

Sews any fabric, wet or dry, thin or thick fine stitch or coarse stitch.

SEND FOR CATALOGUE.

Bleaching, Dyeing and Finishing Machinery.

ESTABLISHED, 1873.

WHITINSVILLE SPINNING RING CO.

Our Patented Specialties.
DOUBLE RIBBED RINGS, U.S.
STANDARD TRAVELER CLEANERS.
METALLIC BURNISH LIKE
THAT PRODUCED BY
THE TRAVELER.

WHITINSVILLE, MASS. U.S.A.

NATIONAL RING TRAVELER CO.

—MAKERS OF STANDARD—

SPINNING AND TWISTING TRAVELERS

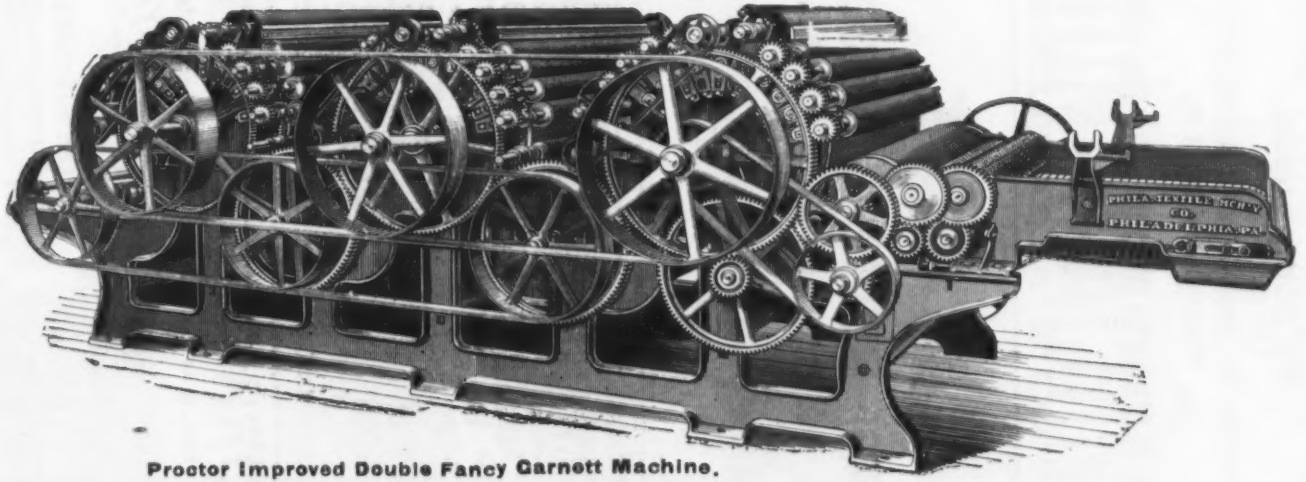
OF EVERY DESCRIPTION.

PROVIDENCE, - - R. I.

A. CURTIS TINGLEY, Treasurer.

GARNETT MACHINES

BREASTS, BURRING MACHINES,
FEED ROLLS, LICKERS-IN. . . .



Proctor Improved Double Fancy Garnett Machine.

"CYCLONE" DRYERS

WOOL
COTTON STOCK
YARN
UNDERWEAR
HOSIERY

PHILADELPHIA
TEXTILE MACHINERY CO.,
Hancock and Somerset Streets, PHILA., PA.

"Nothing is either great or small except by comparison."

This accounts for the GREATNESS of the Picking Machinery built by

THE A. T. ATHERTON MACHINE CO., Pawtucket, R. I.

MANUFACTURERS OF

COTTON MACHINERY.

NOTICE.

Harriman Automatic Mechanisms

On NEW and OLD LOOMS.

Attached by

THE AMERICAN LOOM COMPANY,

READVILLE, MASS.

FAIRMOUNT MACHINE CO.

22ND & WOOD STS.
PHILADELPHIA.

THE LATEST AND BEST

LOOMS, DOBBIES, HARNESS MOTIONS

BEAMING, SPOOLING, WINDING, DYEING AND SIZING MACHINERY.

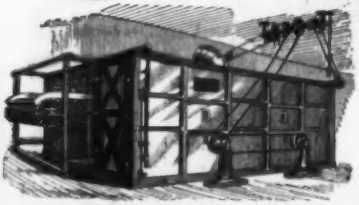
POWER TRANSMITTING MACHINERY.

FREIGHT ELEVATORS. PATENT FRICTION CLUTCHES.

"HURRICANE" DRYERS

—FOR—

WOOL, COTTON, HAIR YARN, STOCKINGS, UNDERWEAR, &c.



Automatic Stock Dryer for Cotton and Wool.

PHILA. DRYING MACHINERY CO.,

CARBONIZERS,

Yarn Scouring Machines.

"HURRICANE" FANS

for Ventilating and Drying.

Best in Construction. Lowest in Price

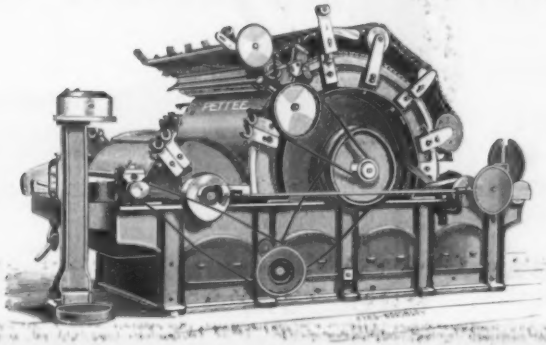
Plans, Estimates and Catalogues sent upon application.

6721 GERMANTOWN AVE.
PHILADELPHIA, PA

Saco and Pettee Machine Shops,

Newton Upper Falls, Mass., U. S. A.

COTTON MACHINERY



PICKERS, SLUBBING,

REVOLVING FLAT CARDS,

INTERMEDIATE AND ROVING FRAMES,

RAILWAY HEADS,

DRAWING FRAMES,

SPINNING FRAMES, SPOOLERS.

SHOPS:

Biddeford, Maine.

Newton Upper Falls, Mass.

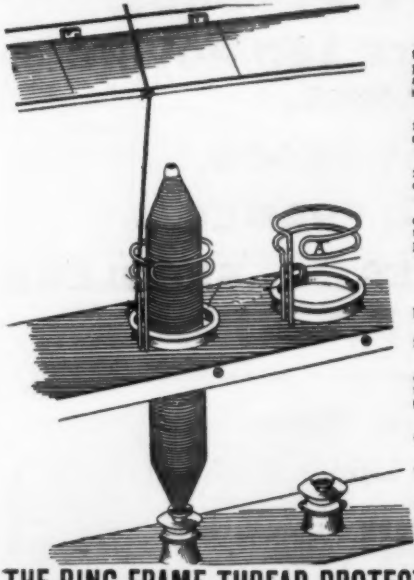
Southern Agent: A. H. WASHBURN, Charlotte, N. C.

YOUR SPOOLING! Improve the Quality. Decrease the Cost.

The Barber Knotter will do it. Can you afford to be without it?

BARBER & COLMAN, Room 1119, 11 Pemberton Sq.
BOSTON, MASS.

New Thread Protector for Ring Spinning



The following advantages are claimed for this protector.

1. The speed of the frame will be increased, and also the production on frames without any protectors or plate separators about twenty five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threshing and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins.

4. The life of the traveller is prolonged fully fifty per cent on account of a more even tension being imparted to the traveller, the same being held in a perpendicular position at all points of the traverse,

5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the operator can attend many more spindles in consequence.

10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y. in whose mills the protectors have been in use on all spinning frames since October, 1899, and by permission we refer to said firm for a confirmation of our claims.

THE RING FRAME THREAD PROTECTOR CO., - Amsterdam, N. Y.

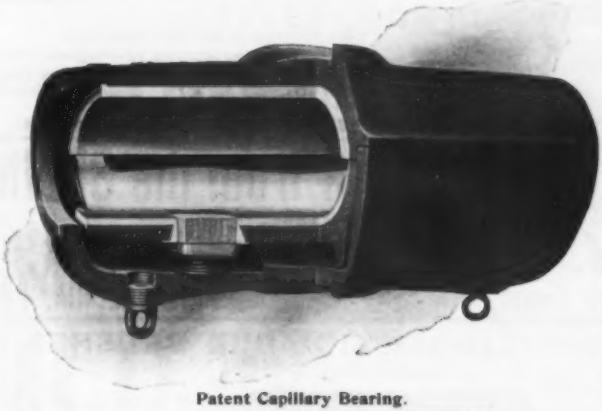
THE DODGE MFG. CO.

Engineers, Founders, Machinists,

MISHAWAKA, IND., U.S.A.

Manufacture the Greatest Variety and have the Largest Factory in the World exclusively devoted to the Production of

Power Transmitting Machinery.



Patent Capillary Bearing.

The "Dodge" Line of Self-Oiling Bearings combine economy in lubrication and the reduction of frictional losses to the minimum.

"The 15 anti-friction Dodge Capillary Hangers furnished the East Division High School, 3 years ago, have given very great satisfaction. It has been our custom to oil the boxes ONCE A YEAR The speed of the shaft is about 200 RPM, and we have never had any difficulty with them. I regret exceedingly that all the hangers in our shop have not these boxes, as we have to oil the others daily."

JAS. F. BARKER,
Instructor, Dept. Manual Training.

MILWAUKEE, WIS., Oct. 13, 1900.

Our B6 Catalogue, 3d edition, might interest you.

Every Mill Man
Should Keep Posted by Reading
Power and Transmission
a unique publication in trade literature exclusively devoted to
MODERN POWER TRANSMISSION ENGINEERING
copiously illustrated with typical installations. Other articles of interest to the up to date factory are also contained in each issue. Sample copy free by applying to
THE DODGE MANUFACTURING CO. ENGINEERS FOUNDERS MACHINISTS MISHAWAKA, IND. U.S.A.
BRANCHES ~ BOSTON NEW YORK CHICAGO CINCINNATI ATLANTA LONDON, ENG.

ANYTHING

Entire Outfits for New Mills, or small and odd items that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.
PROVIDENCE, R. I.

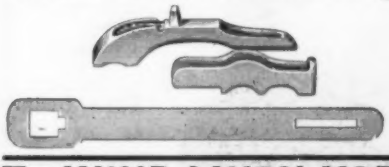
in Mill Supplies.

E. Dixon. Established 1876. F. M. Dixon.

DIXON LUBRICATING SADDLE CO., BRISTOL, R. I.

Sole Manufacturers of

Dixon's Patent Locking Saddles and Stirrups



The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

The Stirrup is always in place.

No bent stirrup resting on rolls.

Manufacturers of all kinds of **Saddles, Stirrups and Levers.** Send for Samples and Prices.

Spinners' Supplies in general.

To WIND LINEN YARNS from the SKEIN

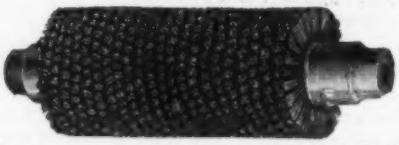
WRITE TO

W. W. ALTEMUS & SON,

2824 North 4th Street, - - - PHILADELPHIA, PA.

FELTON'S CYLINDER COMBER BRUSHES,

Made with

Patent Fibre  Bristle

The Patent Fibre Brush is a very satisfactory brush, but the one with Bristle Stock is the longest wearing and best.

S. A. FELTON & SON CO., Manchester, N. H.

EVAN ARTHUR LEIGH,

Successor to E. A. Leigh & Company,

35 & 36 MASON BUILDING - - - BOSTON, MASS.

Sole Agent in the United States and Canada for PLATT BROTHERS & COMPANY, Ltd., by far the largest makers in the world of

Cotton, Woolen and Worsted Machinery

For All Classes of Work.

MATHER & PLATT'S Dyeing and Finishing Machinery.
JOSEPH SYKES BROS.' Card Clothing for Cotton.
CRITCHLEY'S Card Clothing for Woolen and Worsted.
LOOMS of all descriptions, etc

WATSON'S

HEDDLE FRAMES.
WIRE HEDDLES.
TEMPERED STEEL WIRE
STRIPPER CARDS.

ADDRESS L. S. WATSON MFG. CO., LEICESTER, MASS., FOR THE VERY BEST MADE

BLOCK CUTTING

For Fabric and Hosiery Printing.

We Design and make Printing Blocks in type metal, wood, copper, steel, or any material.

We manufacture our own rock maple Rollers and Blocks, and carry a large and well seasoned stock on hand.

Our Calico Stamps are executed by Manchester experts.

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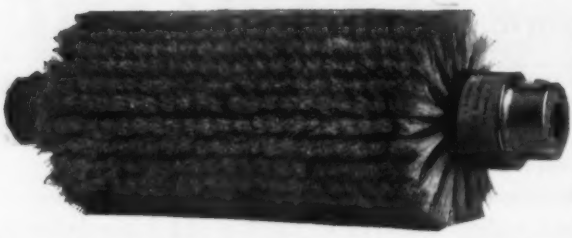

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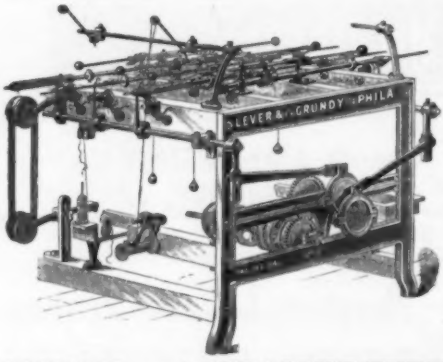

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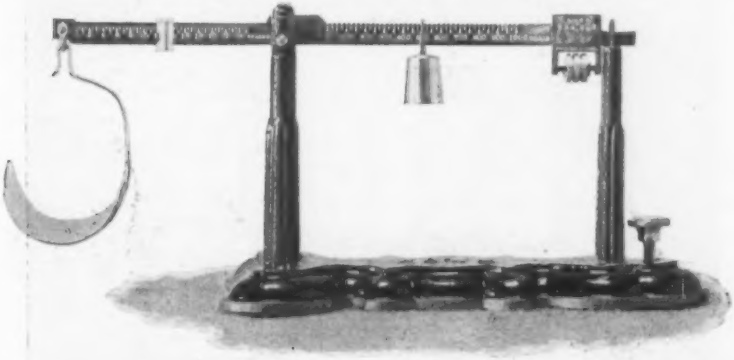

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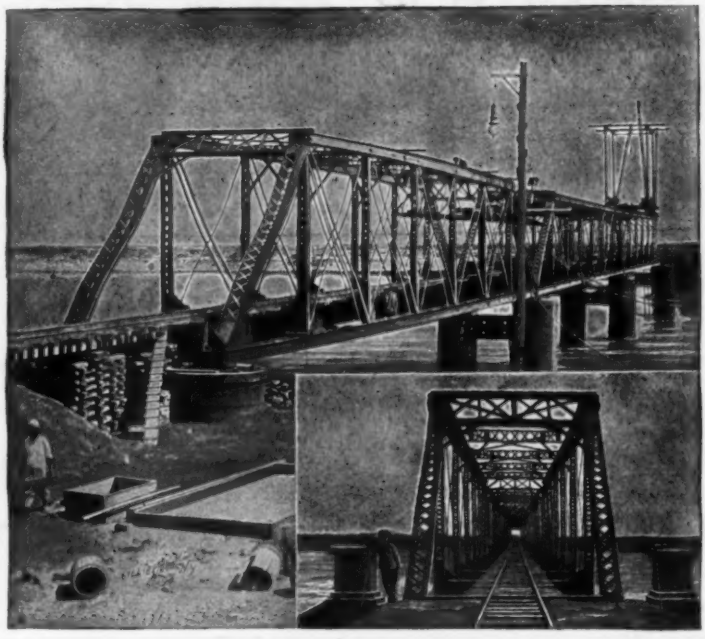

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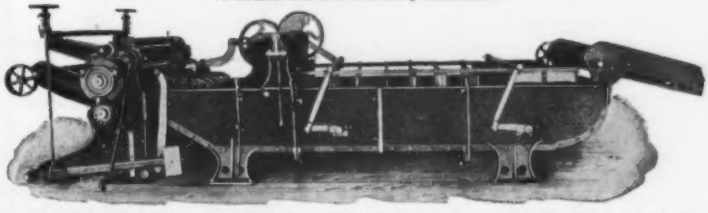

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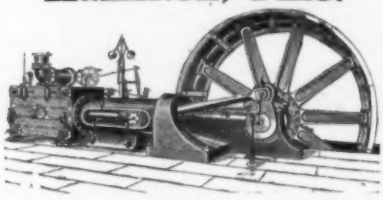

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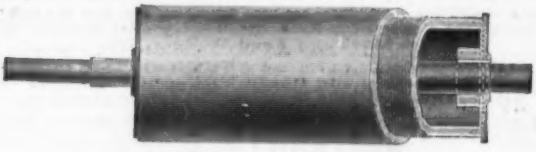

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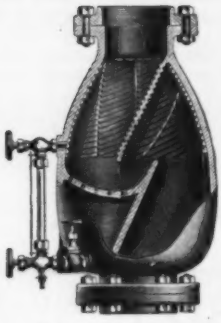

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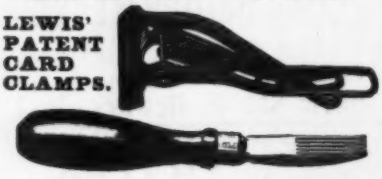

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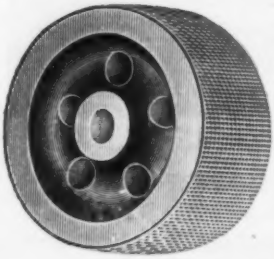

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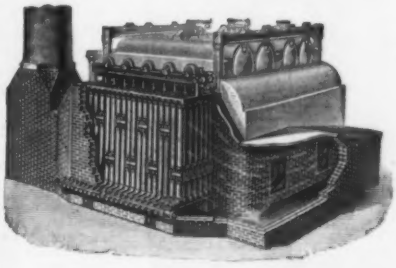

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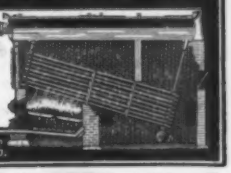

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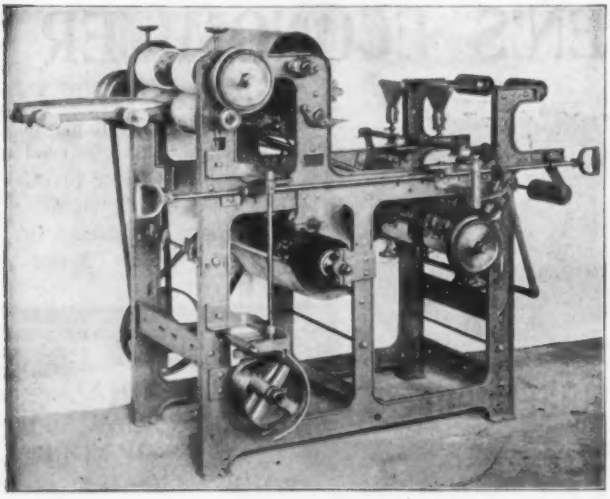

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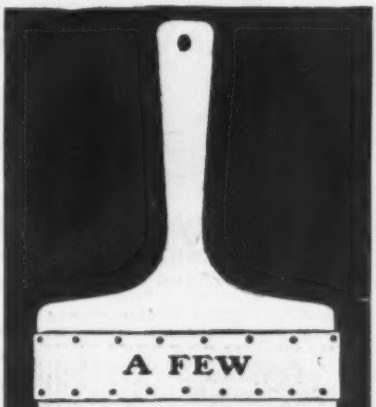

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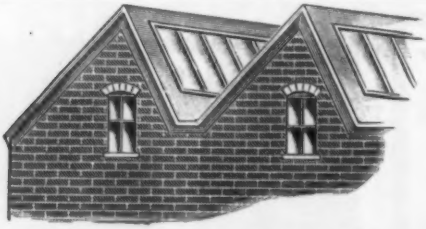

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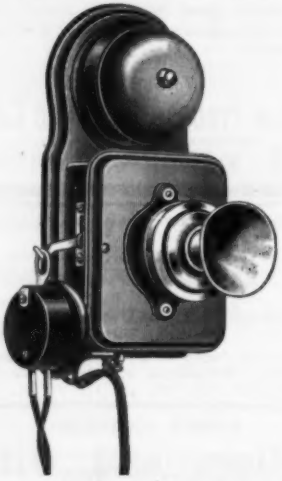

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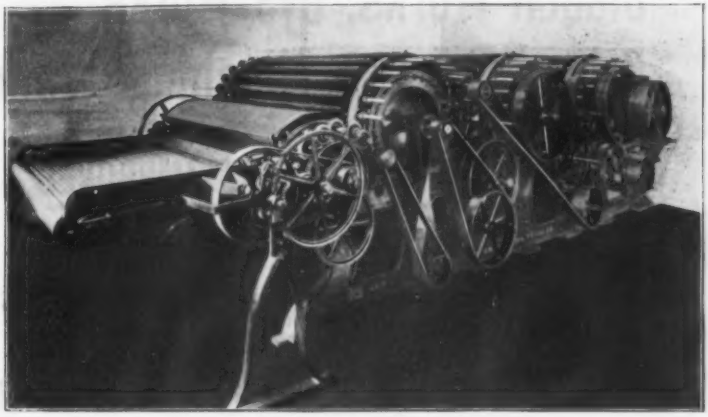

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CONTENTS.

	PAGE
Portrait and Biographical Sketch of Edward G. Richmond	649
Causes of Depression in Woolen and Worsted Manufacturing	650
Cotton Fabrics	652
Men's Wear Woolens	655
Notes of the Month	656
Wool Market	657
Cotton Market	660
Mohair	662
The Barber Knotter	666
Annual Meeting of the Silk Association of America	667
Spooling Machinery	669
Garnetts	671
Cotton Press for Round Bales	672
Cotton Department Cost Finding—Breakage of Yarn in Spinning—Stripper for Revolving Top Flat Cards—Improved Cop Winding Device—Carding Cotton—Analysis of Grey Cotton Cloth—Speed of Warpers	673
Wool Department The Finishers' Difficulties—Prevention and Removal of Washer Wrinkles—Improved Dresser Spool Rack—Cloth Analysis—Combined Carding and Spinning Machine	681
Knitting Department The Knit Goods Situation—A Modern Knit Goods Dyehouse—Washing and Scouring Knit Goods—Seamless Hosiery—Sizes Hosiery	688
Silk Department Leading European Silk Fabrics for Spring—Improved Method of Weaving on Needle Looms	697
Power Department Water Power—Ventilation and Heating—The E. Howard & Co. Watchman's Clocks	703
Dyeing Department Recipes—Pneumatic Dyeing—Treatment of Dyehouse Accidents—Acetates of Alumnia, Lime and Tin for Printing—Tannin as a Mordant in Dyeing Cotton—Bleaching Wool with Bisulphite of Soda	710
Questions and Answers	718
New Publications	723
Industrial News	725
Textile Patents	645
Mill News	730
Personals	739
Buyers' Index	743

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List of Textile Patents.

Issued Feb. 5, 12, 19 and 26, 1901.

Cards, Piano Machine for Punching Jacquard. 669,350. V. Royle, Paterson, N. J.

Compressing Cotton, Wool, etc., Apparatus for. 669,260. G. A. Lowry, Chicago, Ill., and W. M. Holmes, Hoosick Falls, N. Y., assignors to Planters' Compress Co., Boston, Mass.

Fabric Having Metallic Teeth or Wires Secured Therein. 669,509. A. L. Cudey, Paris, assignor to Societe Cudey & Compagnie, Fontaine-le-Bourg, France.

Hosiery, Manufacture of Seamless. 669,530. E. E. Kilbourn, New Brunswick, N. J.

Knitted Fabric and Producing Same. 670,880. W. H. Jackson, assignor of two-thirds to E. Blood, Philadelphia, and J. Blood, Lewisburg, Pa.

Knitted Fabrics, Machine for Running on. 670,308. W. D. Butz, Norristown, Pa.

Knitting Machine. 670,159. W. K. Millholland and U. G. Lee, assignors to Geo. D. Whitcomb Co., Chicago, Ill.

Knitting Machine Attachment, Automatic Circular. 670,489. G. Black and T. L. Dodd, assignors by mesne assignments to J. E. Henry, Philadelphia, Pa.

Knitting Machine, Circular. 670,892. Harry Clarke, Nottingham, Eng.

Knitting Machine, Circular. 669,647. Sylvester J. Kutz, Reading, Pa.

Knitting Machine, Circular. 670,828. Louis N. D. Williams, Ashbourne, assignor of one-half to R. W. Scott, Philadelphia, Pa.

Knitting Machine. 669,730. Edw. E. Kilbourn, New Brunswick, N. J.

Knitting Machine Thread Changing Mechanism. 670,392. Arthur N. Ames, assignor to Mayo Knitting Mch. & Needle Co., Franklin, N. H.

Knitting Machine Needle. 670,886. Elmer E. Newton, assignor to Franklin Needle Co., Franklin, N. H.

Loom. 669,916. Wm. B. Erskine, assignor to American Automatic Loom Co., New York, N. Y.

Loom, Auxiliary Box Motion. 669,824. John Eaton, assignor of two-thirds to I. Sutton, Paterson, and A. McDermott, Warren Pt., N. J.

Loom, Color Feeder. 669,553. Daniel M. Seaton, San Francisco, Cal.

Loom for Weaving Tufted Fabrics. 669,634. Geo. W. Grosvenor, Kidderminster, Eng.

Loom, Jacquard Mechanism. 669,658. Walter Paton, Carlisle, Eng.

Loom, Needle. 669,523. Otto Hallensleben, Hilden, Ger.

Loom Picker-Stick Buffer. 669,760. Francis A. Mills, assignor of one-half to G. B. Emmons, Methuen, Mass.

Loom Picker-Stick Lug Strap. 670,429. Geo. A. Lyon, Philadelphia, Pa.

Loom Shuttle. 669,504. J. C. Bryan, Augusta, Ga.

Looms, Electric Stop Motion for. 669,620. John A. Clark, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

Loom, Warp Stop Motion Mechanism. 669,472. W. E. Allen, Salem, Mass., assignor to Draper Co., Portland, Me., and Hopedale, Mass.

Loom, Weft Thread Controlling Attachment. 669,339. Carl Fuchs, Paterson, N. J.

Mercerizing, etc., Fibre and Yarn, Machine for. 670,098. Henry F. A. a' Brassard, Bradford, Eng.

Tire Fabric. 670,413. Pardon W. Tillinghast, Edgewood, R. I.

Warp Machines, Circular. 670,497. Henry Hill, Nottingham, Eng.

Wool Cleaning Machine. 670,643. F. G. Sargent, Graniteville, Mass.

Wool, Extracting Grease from. 669,955. Walter Erben, Philadelphia, Pa.

Patents and Patent Causes.

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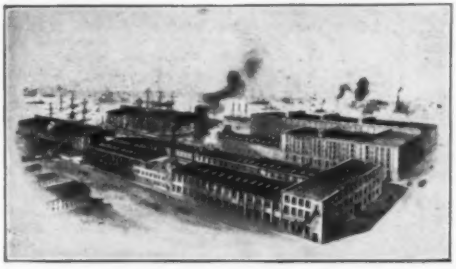

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EDWARD G. RICHMOND.

TEXTILE WORLD.

Vol. XX. APRIL, 1901. No. 4.

EDWARD G. RICHMOND.

Edward G. Richmond, president of the Richmond Spinning Company, Chattanooga, Tenn., was the leading spirit in the establishment of the enterprise. He is the son of Dean Richmond, of New York State, who was president of the New York Central Railway, and one of the most prominent men of his time. Years ago, the son, who inherits the judgment and commercial prudence which was characteristic of his father, recognized the great possibilities of the South in the line of industrial development. He possessed the courage of his convictions, and invested largely in Southern enterprises, and today he is an influential factor in all of the textile enterprises which have been established in his particular section of the South. He is the largest stockholder in the Richmond Hosiery Company, and president of the corporation. This concern has been enlarged several times since its establishment, and is today among the most successful knitting mills of the South.

The Richmond Spinning Company, of which he is president, is a comparatively new enterprise, started to manufacture combed Egyptian and combed and carded American Peeler hosiery yarn. When this enterprise was first broached manufacturers in the North were very sceptical as to the success of a mill on such goods in the South, but the results have thus far fully justified the judgment of its promoters. It is equipped throughout with the latest improved machinery adapted for this particular line of goods, and is one of a very few mills of its class in the South.

In addition to these textile mills, he is the executive head of the Richmond cotton oil properties of Chattanooga, Tenn., Memphis, Tenn., Kennett, Mo., and Sheffield, Ala. Besides these important industries, Mr. Richmond is president of the Keyser Manufacturing Company, and the leading spirit in the Southern Roofing and Manufacturing Company, Atlanta, Ga. These, with other extensive investments in Southern fields, make Mr. Richmond one of the largest single investors interested in the Southern manufacturing industries.

These various enterprises in which Mr. Richmond is interested have demonstrated by their success his exceptional judgment and executive ability. His varied interests receive his closest attention. His philanthropy, while unheralded, is well known to his associates. The history of the textile industry in the South could not be accurately written without giving prominence to Mr. Richmond, whose enterprise and faith in the future of the industry in that section have done so much to hasten its development.

CAUSES OF DEPRESSION IN WOOLEN AND WORSTED MANUFACTURING.

The present conditions in the woolen and worsted industry form a marked contrast with general business throughout the country, and prompts the question heard on every hand, "What is the matter with the woolen industry?" For fourteen months the market for raw material has been falling with scarcely a sign of recovery, and today prices are not far from those of free wool days. The goods market is in an equally unsatisfactory state; the sales of light weights fell far short of enough to keep the looms running, and the heavy weight business so far this season is of small dimensions; there is yet time for a partial recovery in the volume of the present season's business, but experienced observers are of the opinion that the heavy weight business will show little if any improvement over that of light weights. As is always the case, a few mills are busy, but this is due to special conditions which do not help to explain the general depression.

A few of the advocates of that low tariff policy tried in 1894, find sufficient courage to put forth the claim that the present depression is due to the high tariff on wool and woolens. Is this pretension worthy of consideration? The experiment of free wool and a low tariff on goods was given a fair trial. It was accompanied by business depression and panic that brought the woolen and worsted industry to a state of collapse. Many of the best and strongest mills were ruined financially, and others were left in a tottering condition. A low tariff has been tried and found wanting.

Mill extension cannot be advanced as a cause of depression in the woolen and worsted industry, for there has been no increase in machinery such as we have seen in the cotton industry; the growth of our woolen and worsted mills has not kept pace with the growth of the country's population. But while this is true, there has been an increase in the capacity of the machinery which has not taken place in cotton manufacturing; this is not due so much to the improvement in the machinery as to the change in the fabrics produced. In the last twenty years there has been a steady movement, particularly in men's wear goods, towards the reduction in the number of threads per inch. Formerly the idea had a strong hold on manufacturers that goods to be well made must be made from fine yarn. Manufacturers have learned that this is an error. In many cases the reverse is true. The change from the fine spun fabrics of twenty years ago to the coarse spun cloths of today has been gradual but steady. It has been accompanied by a corresponding increase in the production capacity of the woolen loom. Statistics as to this change are in the nature of things unattainable, but all familiar with the men's wear fabrics of 1880 and those of 1901, know of this alteration in construction.

Three and one-quarter yards of six-quarter goods will make a suit of clothes whether there are thirty or sixty picks per inch. while a loom will turn out cloth for two suits in one case in the same time that is required to make cloth for one suit in the other. Here, we believe, is found a very potent cause for the ease with which our woolen and worsted mills supply the demand for their products.

Another cause will be found in the use of lighter fabrics. Two decades ago a heavy weight fabric weighed from twenty-five to thirty ounces per six-quarter yard. Today twenty ounces is not far from the average weight required. A like change has taken place in light weights. Formerly sixteen ounces was about the weight required, while now the aim is to make the goods as light as possible while seeking to retain a firm handle

of the fabric. This change in the weight per yard has enabled the machinery to turn out more yards in the same time. These alterations in weight and texture are generally lost sight of when seeking an explanation of present conditions, but they are none the less effective. They admit of no remedy, in fact none is desirable, for it is a distinct gain to all, for one man to do the work of two.

Another cause for the ease with which the demand for woolens and worsteds is supplied, doubtless lies in the increased use of cotton where formerly wool was the material required. The advance in the arts of coloring and designing cotton fabrics has made this substitution of cotton for wool possible. The effect of this change has been that more of the yarn required for men's wear cloths has been produced on cotton machinery, and a correspondingly less amount required from the woolen cards and mules.

Other causes may contribute to the lessening of demand for woolens and worsted; such for instance, as the heavy importations, during free wool years and the substitution of knit for woven fabrics for certain uses; we believe, however, the changes of the fabric first mentioned are the principal factors in the situation. None of them admit of a remedy; each one of the changes referred to is a benefit by reducing the cost to the consumer. They have been a hardship to the men's wear manufacturers, but, viewed in the light of the greatest good to the greatest number, are long steps in the march of progress.

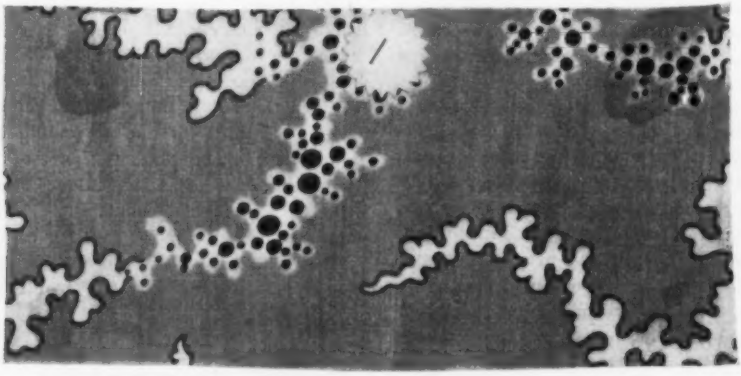
It being neither possible nor even desirable to alter the conditions which have brought about so large a surplus of supply over demand for men's wear goods, it is clear that the only course for manufacturers to adopt is to limit their production to the size of the demand. An idle mill is not necessarily a bad sign; it may in reality be a healthy indication. It is only by confining the product of a mill to actual orders that a balance of supply and demand can be maintained. Cancellations and returned goods will still be a cause for the accumulation of stocks of goods, but those very abuses are both the cause and effect of accumulated stocks. The arbitrary return of goods or cancellation of orders will never be checked as long as large stocks of goods are seeking a market. While it is easy to point out this remedy, it is difficult if not impossible to secure united action on the part of a vast number of independent and widely separated concerns. Each manufacturer drives his mill for all it is worth, struggles for orders to keep the looms running and the result is overproduction.

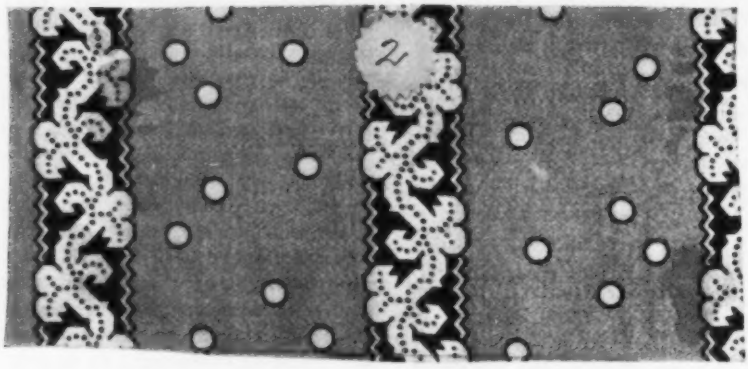
To balance the demand with a corresponding supply, it is necessary that the industry should be guided as a unit. The problem of how to bring this about is still unsolved. Combination has not yet advanced to the point where one can judge whether it will afford the desired solution or not. About fifty-four hundred looms are controlled by the American Woolen Co., and their aggregate yearly production is not far from $30,000,000. We can estimate the product of this firm much more closely than that of the mills outside of this company. Taking the U. S. census figures of 1890 as a basis, and excluding fabrics such as flannels, satinets, linings, carriage cloths, etc., we find the value of the yearly product of the remaining lines of goods to be $128,756,000. Allowing for the same percentage of growth between 1890 and 1900, that took place between 1880 and 1890, we have $143,691,696 as the estimated total at the present time. Of this amount the combine's product forms about $30,000,000 or nearly 21%. This is approximately the progress made in the woolen and worsted industry toward bringing the business under one head. It is but one-fifth of the whole industry, but marks an important step towards combination.

COTTON FABRICS.

Probably in no previous year have so many attractive designs in cotton fabrics come from the looms of the country, as have appeared this season. Our illustrations show designs in five different fabrics which have met with a large sale.

No. 1 is a popular print cloth, placed upon the market by the Arnold Prints Works, under the name





of Foulard d'Alsace. It is 30 inches wide, and sold to the trade at 17½ cents. Our analysis of the fabric gives the following particulars:

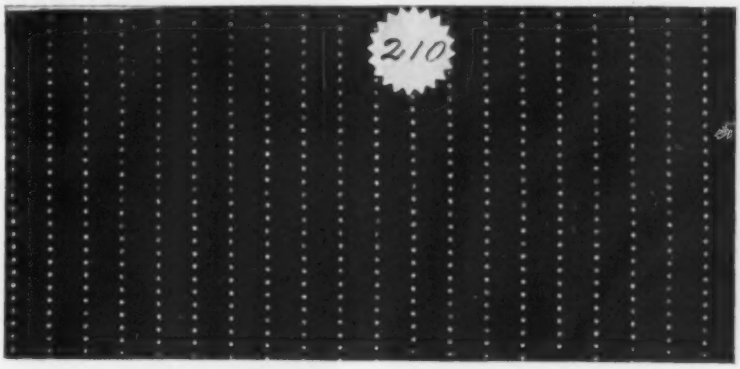
Number of yards per pound—11⅛.

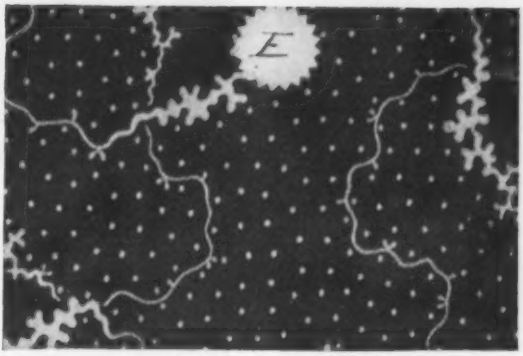
Warp—116 threads per inch, single 80's.

Filling—64 threads per inch, single 150's.

Plain weave.

No. 2 is a printed sateen, sold by





the same concern, and is made in a variety of styles and colorings. It is known as Cachemire de Soie. It is 30 inches wide, and sold at 20 cents net. The analysis results as follows:

Yards per pound—5⅝.

Warp—104 threads per inch, single 68's.

Filling—168 threads per inch, 72's.

Weave—5-end sateen.

Both warp and filling yarn are twisted to the right. This is an important point in connection with the weave employed. Right twist in both warp and filling produces what is termed a twilled face sateen.

No. 3 is a successful fabric, from the Cocheco Manufacturing Co., sold under the name of Rivoli Stripes. This cloth is 31 inches wide, and is sold to the jobber at 10½ cents, less 10 and 5 per cent. The analysis is as follows:

Yards per pound—6⅞.

Warp—72 threads per inch.

Warp yarn ground work single 40's. cords single 12's.

Filling—56 picks per inch, single 85's.

Another popular fabric is shown at E. It is made of mercerized cotton, and known as Eddy silk. This cloth is 30 inches in width, and is sold by Wm. Simpson Sons & Co., at 17½ cents net. The analysis results as follows:

Yards per pound—5⅝.

Warp—104 threads per inch, single 60's.

Filling—140 threads per inch, single 65's.

Weave—5-end sateen.

The warp and filling are both twisted to the right, and the same remarks regarding twist and weave, made when considering sample No. 2, apply to this fabric.

No. 210 represents a style of the Blackhide shirting twills sold by Wilson, Bradbury & Company. They are standard goods of their class, 27 inches wide, and sold to the jobbing trade at 7⅝ cents per yard. The analysis results as follows:

Yards per pound—2⅞.

Warp—70 threads per inch, single 14's.

Filling—38 threads per inch, single 16's.

Three-leaf warp twill to the left.

WOMEN'S WEAR.

There is still a large trade in heavy rainy-day skirtings, and for this purpose nothing has been found so well adapted as satinet. This cloth has been utilized very extensively for the purpose of printing into broad back designs.

No. 306 represents a 54-inch all wool Venetian cloth, sold by Charles Hamilton, at 62½ cents, less eight per cent. This particular fabric, as well as those of a similar character, are being purchased freely for fall delivery. The goods are made of all wool stock, and the analysis results as follows:

Weight per 6/4 yard—11½ ounces.

Warp—45 ends per inch, 4 run yarn.

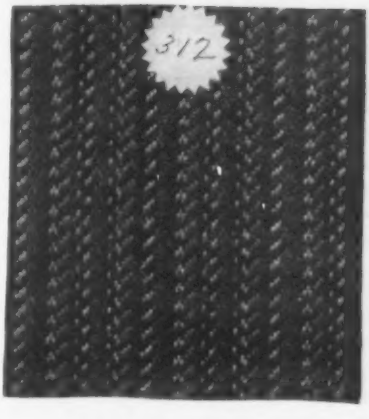
Filling—23 ends per inch, 2½ run yarn.

The sizes and threads per inch in these Venetian weave samples, and the other samples referred to in this article, are taken from the finished goods, and allowance must be made for loss or gain, as the case may be, when calculating the size used in the loom.

MEN'S WEAR WOOLENS.

The volume of business in men's wear woolens transacted so far this season has been very unsatisfactory, and a marked contrast with the excitement and heavy transactions of a year ago. At that time, the boom was at its height, and orders were placed by clothiers who seemed to be under the impression that a woolen goods famine was imminent. Quite the contrary sentiment prevails today, and conservatism is pronounced. The heavy cut in prices made at the opening of the season has failed to stimulate trade, and many are of the opinion that this cut was a mistake, and that as many goods would have been sold at five, or even ten, per cent. above present quotations, as have been marketed at the low prices. While no reason is given for this opinion, there exist several reasons for doubting its soundness. In the first place, the reduction in prices has not been in any greater proportion than the fall in wool values since March, 1900. Wool is nearly 35 per cent. lower today that at that time, while goods have been reduced about 20 per cent. Allowing for the fixed character of the other items that enter into the cost of goods, the reduction in the price of goods is about equal to that in the price of wool.

Deering, Milliken & Company have done a very good business in a cotton mixed fabric No. 307, weighing about 19 to 20 ounces for 6/4 yard, and contains about 42 threads per inch in the warp and 38 per inch in the filling. The patterns are subdued, and for this reason cannot readily be illustrated on our pages. The yarn is spun about 2¼ run, and in addition to the 18 per cent. of cotton, the wool stock is of a fine grade, and at the price at which the goods are sold (95 cents per yard), must necessarily be more or less wool substitutes. The same firm are selling a fabric, shown at 308 in our illustration. The price is quoted to us at $1, less eight per cent.



There are 34 threads of warp, and 34 of filling per inch in the goods, which weigh 20 ounces per yard, the yarn being about 2 run. While no cotton is in this fabric, the goods must necessarily be composed of wool substitutes to a large extent.

No. 309 represents a fabric sold by Sullivan, Vail & Company, at 95 cents; it weighs 20 ounces, 6/4, and has 25 threads of warp and 25 of filling per inch, the yarn being spun to about 1⅜ runs.

No. 310 illustrates one pattern brought out in a fabric sold by Sullivan, Vail & Company, at $1.12½ for 6/4 yard. The goods weigh 20 ounces per 6/4 yard, and have 24 threads warp and 25 of filling per inch. The yarn is spun to about 1¼ run. All of the fabrics so far referred to contain no worsted, but are finished with a cheviot face.

No. 311 illustrates a wool and worsted fabric, offered by Sullivan, Vail & Company, at $1.37½. The goods weigh 20 ounces per 6/4 yard. All of the worsted is in the face warp. There are 33 threads worsted face and 33 threads wool backing per inch in the warp. The worsted is about 2/26's, and the back warp is spun to two run. There are 37 threads of filling per inch, spun 2¾ run. The filling is an all wool thread, similar to the backing warp. The quality of the worsted is ¼ blood; as the filling and backing warp are made of fairly fine wool stock, and as there is but ten per cent. of worsted in the goods, the fabric handles very soft, considering the quality of the warp face. There is no cotton used in the wool threads, but the size at which it is spun will permit of the use of quite a large percentage of short wool.

No. 312 is another fabric, sold at $1.82½, by Sullivan, Vail & Company. It weighs from 17 to 18 ounces per yard, 6/4. The warp is made of worsted yarn, about 2/36's, 96 threads per inch. The filling is a wool thread, 56 ends per inch, and spun to about 3½ runs.

It is understood that these fabrics have met with a very fair sale, and manufacturers can compare the layout given with the prices, in order to form an opinion as to the present condition of the men's wear market.

Notes of the Month.

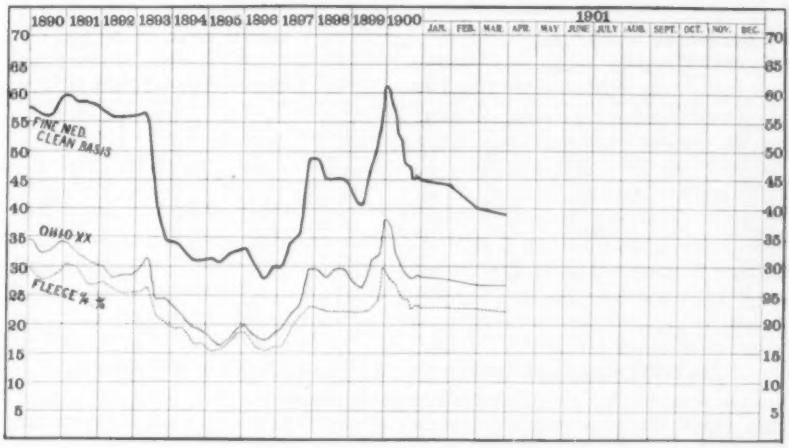
—On the 9th of last February, one of the sprinklers in the Armstrong Cork Co.'s mill, Pittsburg, Pa., was out of order; it was necessary to shut the water from the sprinkler system for a short time to repair the leak; the chances of a fire starting during these few minutes seemed so remote that the workmen probably thought that no risk was being taken; before the sprinkler was repaired, however, a fire broke out in the building, cutting off access to the sprinkler valve, and causing a loss of $570,000. Moral; provide fire sprinkler systems with valves outside of the buildings to which fire cannot prevent access.

—The lace makers continue to come into this country. Two of them, bound for Philadelphia, were detained by the immigration commissioners, and the Treasury Department has recently decided to admit them. It was admitted by the Philadelphia company that native Americans could be taught to run the machines in three months, but that the lace makers' union would not allow an apprentice to be taught in less than three years. The government accepted this view of the case, and made the decision already referred to, on the ground of establishing a new industry.

—So many burning fatalities have occurred in England, caused by the flannelette (cotton flannel) clothing of children catching fire, that an agitation has been started to secure legislation requiring that such goods shall be labeled "dangerous."

—The Russian government is aiding flax growers throughout the Empire to purchase machines for preparing the flax for market according to improved methods which greatly reduce the cost for labor.

WOOL MARKET.



WOOL MARKET.

There has been much greater activity in the wool trade during March than for many months previous; this is especially the case for the closing week of the month.

Large stocks of wool held by bankrupt concerns have been sold, and other firms, who pay one hundred cents on the dollar, have parted with large lots of wool purchased at much higher prices, and which have been held in storehouses since the early months of 1900 for the rise that never came.

This liquidation has removed a load from the market, and a feeling of more confidence pervades wool circles at the beginning of April.

Prices are lower than a month ago, but there is a limit to this downward course, and the increased resistance to further concessions offered by owners of wool indicates that bottom may be near at hand.

Shrewd dealers anticipate that, when the wool grower is asked to part with the new clip, many who have recently sold wool will find it impossible to replace it at the same price.

The woolen and worsted business is not in a very healthy condition at present, but it is by no means a dying industry. Many of the influences which during recent years have tended to depress the business, have exerted their full force, and it is by no means unlikely that the low ebb of 1901 will mark the turning point from which an era of prosperity will be dated.

Study the lines of our wool and worsted yarn charts in this issue, and, bearing in mind that the dip during 1894, 1895 and 1896 was due to a free trade experiment not likely to be repeated, we find the price level of March, 1901, to be unusually low.

The business on heavy weights continues unsatisfactory; some fair duplicate orders on light weights are reported but, on the whole, there is much cause for discouragement on the part of manufacturers in the present condition of trade.

—The substitution of rabbit fur for wool stock in the manufacture of felt hats, which has taken place during recent years, has worked a complete change in the industry. Formerly these hats were made from wool stock carded on special machines; now the rabbit fur is blown on a form in shape ready for the felting process.

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.3	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	386.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.6c3	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
6 mos.	.107	.115	44.0	54.9	.3'8	1.080	.105	.702
Jan.	.018	.018	9.2	10.6	.048	.16	.028	.15
Feb.	.042	.089	7.5	8.3	.037	.11	.011	.08

EXPORTS AND IMPORTS OF MANUFACTURED WOOLENS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.						Imports — Value.							
	Carpets.	Dress Goods.	Flannels and Blankets.	Apparel.	Other.	Total	Carpets.	Cloths.	Dress Goods.	Shawls.	Clothing	Knit Goods.	Other.	Total.
1890	.067	..	.409	3.179	.719	4.374	7.5	161.4	242.0	10.1	18.4	19.8	66.2	525.4
1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	3.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.3
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.6	163.0	144·0	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	3.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.612	.414	.474	4.290	4.074	10.89	17.9	39.6	60.4	.4	7.6	3.9	9.6	139.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	59.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
6 mos.	.471	.040	.583	3.969	3.107	8.17	13.57	21.71	24.95	.51	7.29	2.69	2.61	73.33
Jan.	.110	.044	.165	.578	.255	1.15	1.98	5.57	8.21	.02	.34	.12	.59	16.83
Feb.	.125	.012	.037	.80	.199	1.17	1.87	3.99	6.33	.04	.62	.19	.57	13.61

—The United States consul at Rosario, Argentina, reports that a 33⅓ per cent. reduction in the value of wool for export has been announced. The export tax was formerly four per cent., on a valuation of $3 per 10 kilograms. The present regulation fixes the valuation at $2 per 10 kilograms, which is an arbitrary figure, as the price of wool has fallen below this amount.

—The electric wiring in Charles Bailey & Sons' knitting mill, Fort Plain, N. Y., was recently removed; one old and badly frayed drop cord of an incandescent lamp was inadvertently left in place by the workmen. The exposed wires came in contact, formed a short circuit, and set the mill on fire. There is pressing need of some device by which the insulation of electric light drop cords will be saved from the wear which the daily handling now makes necessary.

—The strike among the Calais lace workers shows signs of coming to an end. Many of the factories have resumed work, and while but a small portion of the operatives have resumed work, the general opinion is that this long labor trouble is practically over.

—An electric lubricating oil tester, which has appeared in Germany, is described as a spindle connected with an electric motor; the bearings are submerged in the oil to be tested and the loss of power by friction is accurately indicated by an amperemeter.

PER CAPITA CONSUMPTION OF WOOL IN THE UNITED STATES.

Much has been said recently about the falling off in the per capita consumption of wool in the United States during the last ten or twenty years, and figures have been exhibited to support the claim of a large shrinkage.

It has been pointed out that in 1900 there was an apparent shortage in the per capita consumption of wool, of over twenty-five per cent., as compared with 1890. These figures are obtained by first estimating the wool clip, then adding the quantity of wool imported, and also the number of pounds to which it is estimated the imports of goods would be equivalent, and from this total subtracting the number of pounds exported; the figures thus obtained are then divided by the estimated population of the country; the result is claimed to be the amount of wool consumed per capita by the people of this country in the form of manufactured goods.

Before calling attention to the weak places in this reasoning, let us examine the results reached by it for each of the past eighteen years:

	per capita.		per capita.
1882,	8.5 pounds	1891,	8.5 pounds
1883,	9. "	1892,	8.5 "
1884,	9.1 "	1893,	8.8 "
1885,	8.6 "	1894,	86. "
1886,	9.5 "	1895,	8. "
1887,	9.4 "	1896,	8.9 "
1888,	8.3 "	1897,	10.3 "
1889,	9. "	1898,	6. "
1890,	8.7 "	1899,	5. "
		1900,	6.3 "

Yearly average for 9 years, 9 pounds.
Yearly average for 10 years, 7.6.

While these figures are small for each of the past three years, they also indicate that in 1892, probably the most prosperous year of the eighteen, the people consumed but 8½ lbs. of wool per capita, while in 1897, when they were still suffering from the hardships and losses of the preceding five years, they consumed 10 3/10 lbs. of wool per capita, or an increase of over 21 per cent. for the last named year. In other words, the poorer we get the more woolen clothing we buy.

One can apparently confirm any desired theory by this table; but, as a matter of fact, the size of the wool clip, together with the imports of wool and goods, bears but a very remote relation to the amount of clothing consumed by each inhabitant of this country in any single year. This proposition scarcely requires demonstration. Between the consumer of clothing and the grower of wool there is a vast stock of material to be drawn upon in case of emergency. If the importation and growing of wool should cease entirely, the stock of clothing, cloth, yarn, and raw material, would supply the normal demand of the consumer for a considerable time. Omitting from the calculation the give and take which such an immense stock of merchandise permits, is alone sufficient to make such a calculation for any single year of no value.

There are other factors which prevent the wool clip and wool imports from being a safe indicator of the woolen goods consumed, such, for instance, as the tendency in all branches of the trade, retailers, jobbers, manufacturing clothiers, commission merchants and cloth manufacturers during recent years to carry on business with smaller stocks of merchandise.

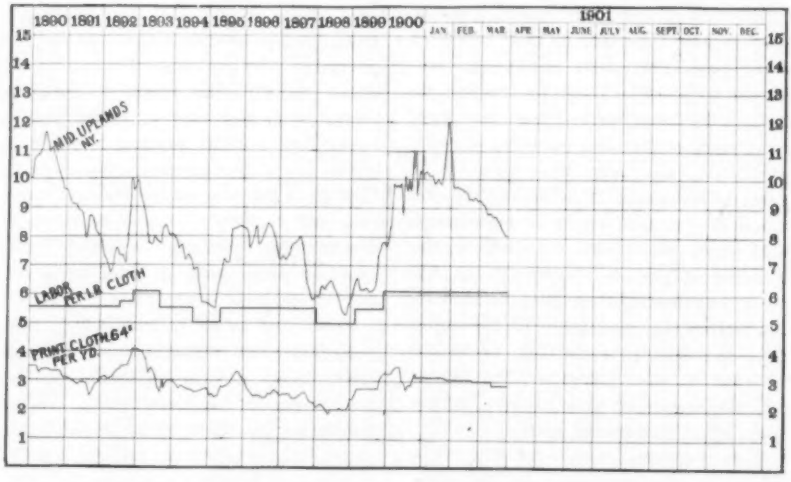
This factor of variation in stocks on hand is, however, greatly reduced when the figures are taken for a series of years. Using the same method of figuring, we find the average yearly per capita consumption of wool for the nine years ending with 1890 to be 9 lbs., and for the ten years ending with 1900 to be 7 6/10 lbs.

A part of this difference of 1 4/10 lbs. per capita is accounted for by the greatly reduced purchasing power of the people during the hard times following 1892. The clothing business was one of the greatest sufferers from this cause.

Another factor which might account for this difference is the size of the stocks of wool and goods in the country now and ten years ago, and concerning which no reliable figures can be obtained.

An inspection of the figures for these eighteen years shows much uniformity of yearly averages until the free wool and low tariff period following 1892 is reached. The wool and woolen business has not yet recovered from the effects of that low tariff experiment, and for this reason the apparent per capita consumption of wool for the years since that period are a most unreliable basis on which to base conclusions.

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900
1901
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
MID UPLANDS NY.
LABOR PER LB CLOTH
PRINT CLOTH 64" PER YD.
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

COTTON MARKET.

Quotations for spot cotton have dropped during March, from 9 1/16 cents to 8 3/16 cents. This has been due to the influence of extensive curtailment in cotton consumption, and to the unsatisfactory foreign conditions.

As the month closes, advices from Liverpool are particularly bearish, indicating a large movement of the India crop. The movement of cotton from the South has been in large volume. It has become more evident as time passes, that the Southern planters are preparing an enormous acreage for the new crop, and the quotations for future deliveries have been especially depressed, January, 1902, falling to 7 1/16 cents. This has been accompanied, however, by rather free purchases of these months for speculative accounts.

The yarn and goods market are in a particularly unsatisfactory condition, and this has exerted its influence upon the quotations for the raw material.

The depression in the cotton goods trade is due in a slight degree to the shrinkage of cotton goods exports to China, which in the seven months ending January, 1899, were valued at $5,033,080; for same period ending January, 1900, $5,448,003; while for the seven months ending January, 1900, they fell to $1,222,577, showing a loss of $4,225,226 for the seven months, or at the rate of $7,243,248.

This makes quite a hole in our cotton goods export trade which at high water mark in 1899 and 1900, reached a yearly total of but $23,300,000. While the loss is nearly one-third of our cotton goods exports, it is but a small part (less than 2½%) of the total business of our cotton mills. The business represented by this loss of export business would keep about

a half million spindles busy, while we have been starting new spindles in this country at the rate of over two millions per year.

We have been building mills with the expectation on the part of many that the world's cotton goods trade was ours as fast as we could supply it; instead of this being the case we confront an actual loss in the small foreign business already secured. This loss is a secondary cause of the depression which is now closing our mills, and which is the natural result of flooding the market with vast stocks of yarns and fabrics which the people will not purchase.

The total visible supply of cotton, as reported by the Chronicle for March 29th, was 4,008,465 bales, as compared with 3,477,723 bales at same date in 1900; 5,201,715 bales in 1899; and 4,550,602 bales in 1898.

The average quantity of cotton per capita of the population, annually retained in the United States for consumption, was 14 3/10 lbs. for the ten years ending 1880; 17 9/10 lbs. for the decade ending 1890; and 21¾ lbs. for the like period ending with 1900. This shows a steady increase per capita during these three decades, and is due doubtless to the great improvement in cotton manufacturing which has reduced the cost of the goods to the consumer.

This reduction is shown by the average price per yard of cotton print

EXPORTS AND IMPORTS OF RAW COTTON AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.									Imports.				
	Sea Island.		Other.		Total.			Cotton Waste.		Raw Cotton.			Cotton Waste.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value	Value. per lb.	Lbs.	Value.	Lbs.	Value.	Value per lb	Lbs.	Value.
1890	9	23	2462	2486	2471	2509	10.15	..	..	8.6	13.9	16.16	..	..
1891	14	31	2806	2876	2907	2907	10.00	..	..	20.9	28.2	13.49	..	..
1892	19	16	2926	2568	2945	2584	8.77	..	..	28.7	32.1	11.18	..	..
1893	8	17	2204	1870	2212	1887	8.53	..	..	43.4	46.9	10.80	1.9	.8
1894	14	29	2669	2080	2683	2109	7.82	..	..	27.7	30	10.83	2.7	.9
1895	15	28	3502	2021	3517	2049	5.82	..	..	49.3	47	9.53	2.9	1
1896	19	38	2316	1862	2335	1900	8.13	..	..	55.3	66	11.93	6	2.1
1897	21	41	3082	2268	3103	2309	7.12	..	..	51.9	59	11.36	5.3	1.7
1898	16	28	3834	2277	3850	2304	5.98	19.1	7.9	52.7	50	9.48	6.7	1.5
1899	14	24	3759	2072	3773	2096	5.55	21.1	8.3	50.4	50.1	9.93	6	2.1
1900	18	30	3082	2388	3100	2418	7.80	38.6	17.7	67.4	79.6	11.81	7.9	2.4
6 mos.	3.4	7.5	1833.3	1785.6	1836.7	1793.1	9.76	27.05	14.41	20.84	29.96	14.37	3.19	.97
Jan.	1.83	3.7	367.6	354.8	369.4	358.5	9.75	4.94	2.52	5.59	8.66	15.5	.48	.15
Feb.	1.18	2.2	233.2	221.2	234.3	223.4	9.55	5.20	2.67	4.39	6.82	15.5	.14	.04

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

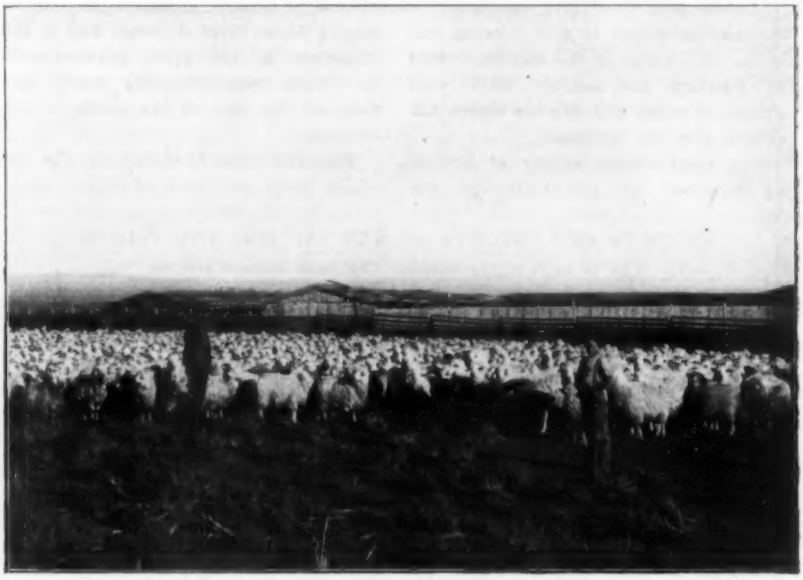
Value in units of $100,000.

Year Ending June 30.	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.8	3.4	114.5	9	71.5	65.8	299.2
1891	26	93	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	13.6	112.5	6.6	58.3	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	63.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	92	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	192.1	21	47.2	55.3	413.2
6 mos.	27.18	28.46	7.97	15.71	79.32	25.66	.99	7.16	89.98	9.64	22.54	28.76	194.73
Jan.	4.95	3.41	1.11	2.57	12.04	12.48	.22	1.25	22.16	1.30	4.99	5.72	46.12
Feb.	4.96	4.96	1.16	2.38	13.46	7.49	.31	1.66	19.76	1.34	6.91	4.11	41.58

cloth for the three decades mentioned: for the ten years ending 1880 this average was 5 3/10 cents; for the decade ending 1890, it was 3 5/10 cents; and for a like period ending 1900, 2 8/10 cents; this shows a decrease in cost of the commodity to be accompanied by an increase in the quantity consumed, and this result will probably be found in all commodities

five years in this country. Mr. Black has had an experience in this business covering sixteen years.

He says: "I learned that Mexican herders preferred to eat goat, rather than sheep, and being much the cheaper animal of the two, I purchased a small flock for the purpose of supplying my herders with fresh meat. About the year 1884, my at-



FLOCK OF THOROUGHBRED ANGORA DOES.

Mohair.

The long, lustrous staple, the picturesque animals and the wealth produced in waste places, combine to make the growing of mohair a most interesting subject. It is the subject of a book written by W. L. Black, of Texas, by whose courtesy we are permitted to make extracts for this article.

The author reviews briefly in the first four chapters the history of the Angora goat and the various theories as to its origin, and then addresses himself to the practical side of the subject, dealing with development of the industry during the past twenty-

tention was called to the Angora, as being a superior breed, and possessing greater commercial value than the Mexican species. I found that I could very easily grade up my common goats by introducing full blooded Angora sires, and I therefore purchased from Col. Richard Peters, Atlanta, Ga., eight males and four females, which cost me close to $750, or about $60 for each goat. The investment turned out a very good one. In a few years I had improved my flock, the condition of which justified me in shearing. I then commenced to enjoy a revenue, which I had not counted on, for, in addition to supplying my ranch with fresh meat, I received annually quite

a handsome return from mohair, and my goats increased so rapidly that in 1892 I had upwards of 8000 head of well graded Angoras, many of them being very superior. I figured that unless I could thin out my stock of goats, they would very soon overrun my ranch. Disease and poverty would occasionally thin out my sheep and cattle, but my goats seemed to be proof against these two powerful elements, for it was only once in a while that a few old ones died from extreme old age. I procured the necessary machinery and slaughtered 3000 head, in 1893, and in 1894, 4000 more, which reduced my number to a reasonable size. I realized from the sale of canned meat, tallow and hides, the latter dressed for rugs and robes, about $3 to the animal, and was well pleased with the results."

The author describes the spread of the Angora goat industry throughout the United States, taking up each state in turn, and in this section of the work is condensed much valuable information for those in different parts of the country who may be interested in the subject. There are no reliable statistics as to the number of Angoras now in the United States, but Col. Black distributed a large number of question blanks among the breeders throughout the Union, and from the information thus obtained bases an estimate as to the number of Angora goats and the shearing capacity at the present time. The figures of each state are given separately and the total for the whole country is 329,300 Angora goats, producing 876,450 pounds of mohair annually.

He says: It has been clearly proven our country is well adapted to the raising of the Angora; all who held their goats until they reached a shearing capacity of two pounds per head, have made money, and are now enjoying better results from this branch of their live stock than any other; but, it is not reasonable to suppose that all breeders will have the patience and financial strength to hold on to stock for several years at a loss, when they could use their land and their energies with a different kind of stock that would yield them better results. The fact that South Africa has been so remarkably successful furnishes no reason for concluding that they have a country better suited to the Angora goat than the United States. If all signs do not fail, we shall soon begin to show our South African friends and others the way Americans can develop an industry when all the disabilities have been removed, and they make up their minds to go to work.

The author devotes a chapter to the preparation of mohair for the market, in which he gives much information based upon practical experience, as to this important branch of the subject. He also writes on the preparation of the skin, and says that in the Angora goat we have perhaps the most perfect substitute for animal fur that can be found. The skin can be taken at various stages in the growth of the hair, and can be made to represent many of the wild animal skins so perfectly that they can hardly be detected from the genuine. The monkey skin muff and boa so commonly worn by young ladies, are nothing else but the straight haired goat, dyed black, and much of the so-called astrachan is the curly hair of the Angora skin; but, the versatility of the Angora goat is by no means confined to imitations of the monkey, boa and astrachan; bear skin, says Col. Black, can be imitated with the Angora goat skin, in such a way as to defy the most expert furrier.

There is a great demand for floor rugs, Angora lace trimmings, muffs, capes, boas, and no skin has been found so suitable for these purposes as the Angora. When considering the flesh of the Angora as a food product, he says that today there is no difficulty in selling these animals in any quantities, provided they are fat, and the sheep feeder stands ready to take as many as the packers reject. The

prejudice against the common goat has had a tendency to restrict the use of the Angora venison; but they are not at all alike, as is clearly shown in tanning their skin into leather. The skin of the common goat is coarse grained and thick, while that of the Angora is very thin and fine grain. Angora venison is as much superior to the common goat as the Belgian hare is superior to our wild native jack rabbit.

A chapter is devoted to the science of breeding and results of crossing the common goat with the Angora. This branch of the subject is treated in a very exhaustive manner, and then the author comes to the important question of profit in raising the Angora goat. A table is given showing the estimated results from breeding 1500 selected two-year-old Mexican does and their progeny from Angora bucks for a period of ten seasons. The recapitulation of this estimate shows a profit of $63,155.

Speaking of the incidental, or by-products, of the Angora goat, the author says that the skin, or pelt, has greater value than the meat, if properly handled. Even the little kid skins can be made into beautiful, as well as useful ornaments. "Talk about bed quilts, why I have seen quilts made from little kids skins that would excel any quilt ever put together out of silk or cotton fabrics, as far as beauty is concerned. The skins make beautiful rugs. Saddle pockets are covered with the skin which sheds the rain, and are very popular. In addition to these may be mentioned muffs, lace trimming, lamp mats, etc. The milk of the Angora goat is of superior quality, though they do not yield as much as some of the common varieties."

ANGORA GOATS CLEARING BRUSH LAND.

Speaking of the best locality for raising the Angora, he says the Southern States perhaps have the greatest advantage, in point of economy in handling the animal, owing to the mild climate, but against this, the Northern States have a tendency to increase the quantity of mohair, and hence what is gained in one section of the country is offset by the advan-

tages in another section, and it may be said that there is no advantage to be had in a pecuniary sense, by locating in the milder climate, provided you can afford to build shelter for your stock in the colder states.

FULL BLOOD YEARLING ANGORA BUCKS.

A chapter is devoted to the question as to where the Angora can be purchased, with statements of breeders about the shearing capacity of their animals. Our illustration shows a flock of thoroughbred Angora does with four months' growth of fleece.

Col. Black states that the greatest profit in breeding the Angora goat, is perhaps in connection with the clearing of some old worn out farm that is grown with briers and brush, and restoring it to a condition of fertility and usefulness, or converting some native forest, or stump land into good farming land.

A mass of testimony has been collected by the author from practical breeders, who have had experience in clearing land by the use of the Angora. The illustration shows a small bunch of Angoras at work on a farm in Madison County, Iowa. It will be observed that the goats have the brush destroyed in the enclosure they are in, and are trying to reach that in the neighboring fields, rather than eat the grass in their own. Illustrations are given showing the condition of the land after the goats had cleared it up.

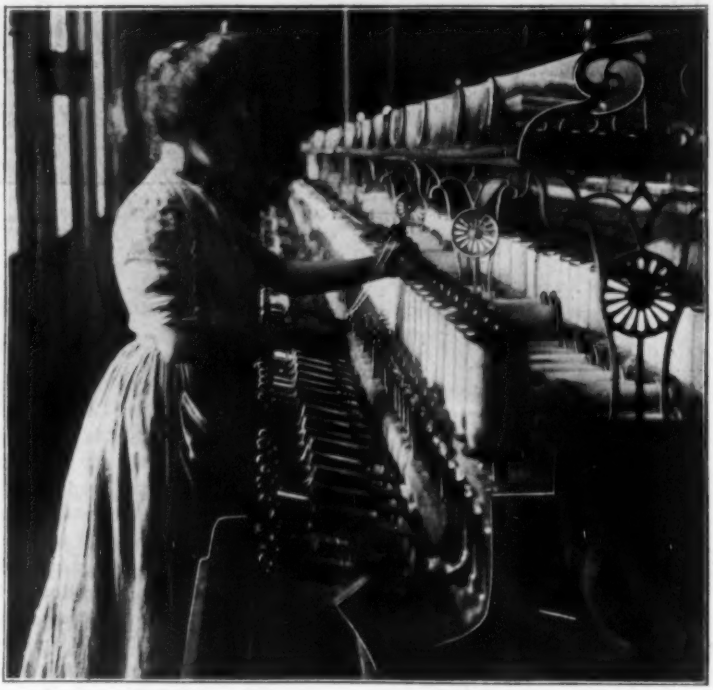
--If the list of new mills built in the South during 1900, rated by spindles, and published in a recent issue of "Cotton" had appeared on the first of April, we should take it as a bit of pleasantry on the part of our contemporary. The list gives 1,410,000 spindles in Alabama. This is a surprising total for one state for one year, being equal to what has been accepted by the trade as a near estimate for the entire South. But this is only a beginning. Georgia looms up with 2,983,000, then North Carolina with 6,428,000, and South Carolina is the banner state, with 6,075,000 spindles. In all, figures for ten states are given, aggregating 21,658,000 spindles installed in new Southern mills in 1900. This is equal to the entire number heretofore supposed to be in all the United States. Either the Southern promoter has been carrying on a masterly "still hunt," something heretofore unheard of in that quarter, or "Cotton" has been imposed upon.

The Barber Knotter.

A NEW MACHINE FOR TYING SPOOLER'S KNOTS.

Probably nine out of every ten of those who read the caption of this article will say "another useless device." This is a natural supposition, because of the seeming impossibility of constructing a machine that will do the work of the fingers in tying knots. It is, however, a fact that such a machine has been constructed, and that many of them are now in successful use in a number of the best cotton mills in New England, and are effecting a large saving, owing to the rapidity and ease with which the spooler tender can tie the threads.

THE BARBER KNOTTER.



OPERATIVE USING THE KNOTTER.

The illustration at Fig. 1 shows the machine, which is light, weighing but three ounces, and, is, therefore, not inconvenient for the spooler to carry on her hand. The machine is fastened to the hand by a strap around the hand, in such a position that the thumb rests in a place provided for it, and the spooler passing the thread over the guide presses the lever with the thumb; the one quick stroke ties the knot and cuts the projecting ends.

The overseer of spooling in a large New England cotton mill, where these machines are used, states that at a conservative estimate, the knotters

will effect an increase of ten per cent. in the production, and a great improvement in the quality of the work in the spooling room, and that the saving in the labor cost for spooling will give a large return on the cost of the machines.

The knots made by this machine are uniform, do not pull out and have but a very short end projecting. This will be found of great advantage in weaving, and also in the finished fabric.

New England mills, and the following is a partial list of the users, showing the number ordered: Atlantic Cotton Mills, Lawrence, Mass., 48 machines; Tremont & Suffolk Mills, Lowell, Mass., 75 machines; Merrimack Manufacturing Co., Lowell, Mass., 63 machines; Dwight Manufacturing Co., Chicopee, Mass., 25 machines; Methuen Company, Methuen, Mass., 20 machines.

The manufacturers, Barber & Colman, 11 Pemberton Square, Boston,

OPERATIVE USING BARBER KNOTTER.

Figures 2 and 3 show the machine in use. These views were taken in a New England mill, where a large number of knotters are now constantly used. The machine is strongly made, the motions are simple, and there is nothing about it likely to get out of order.

This ingenious device immediately appeals to any mill man who sees it as "a good thing if it will work." When he tries it, he finds that it does work, and does what is claimed for it. This has been the experience of some of the best and most conservative mill men, men who do not jump at a new thing until they have demonstrated its value. There are now about 400 of these machines in use in

will be pleased to give further information to anyone interested in the matter.

Annual Meeting of the Silk Association of America.

At the annual meeting of the Silk Association of America, held in New York recently, Catholina Lambert, one of the earliest silk manufacturers in the United States, was elected president. The secretary stated that 1900 had been the most disappointing year so far experienced in the history of the silk industry in this country. He stated that ladies' dress goods were never so cheap as now, and that this is true also of satins, velvets, plushes,

ribbons, sewing silks, and machine twist. The retail prices of goods are said to be less than the cost of manufacture. He added that 75 per cent. of the silk fabrics consumed in this country were now supplied by the domestic mills, while 90 per cent. of the domestic consumption of ribbons is supplied from the same source. He expressed the opinion that improvements in power loom weaving, combined with the factory system, enabled the domestic mills to produce goods as cheap as any in the world.

While the official statistics relating to the silk industry will not be published until next year, Secretary Allen furnished the following figures concerning the machinery equipment: Broad silks, power looms, 32,000; velvets and plushes, power looms, 1550; upholstery silks, power looms, 285; ribbons, power looms, 7000; spinning spindles, 1,000,000, and 1,000,000 other spindles.

The value of production is given thus: Broad silks, yards, 86,000,000; value, $52,000,000, velvets and plushes, yards, 9,500,000; value, $5,000,000; upholstery silks, value, $400,000; ribbons, $17,500,000; machine twist and sewing silks, $9,000,000, and $1,000,000 for laces, nets and veilings.

Notwithstanding the setbacks given to this industry by low prices and unprofitable business in 1900, its development continues. Thirty-nine new silk plants and firms were established in the year. Nineteen of these were in Pennsylvania, 15 in Paterson and two elsewhere in New Jersey, and one each in New Hampshire, Massachusetts and New York.

Fourteen were throwing, 16 broad silks, four ribbons and six braids, gloves and trimmings; one of the above mentioned plants makes both broad silks and ribbons.

The additions to equipment in 1900 represented by the foregoing new plants were: 728 broad silk looms to weaving branch; 81 ribbon and narrow looms to weaving branch; 110,700 spindles to throwing branch; at least $500,000 to capital invested.

The secretary's annual report contained two suggestions for the relief of the silk trade of this country. We quote as follows:

"Overproduction is undeniable. Large mills have been made larger; small mills have been started; new localities are being constantly 'prospected' for the establishment of annexes or outgrowths of establishments in other places. The result is a great increase in recent years, and the end is not yet.

"Two suggestions, which seem worthy of special consideration at this time, have grown out of experiences of the past year and are herewith outlined:

"First—The establishment of an up-to-date credit bureau of information, to secure authentic and frequent reports from concerns desiring credits, which, by transmission to regular subscribers for the service, shall be valuable to buyers and sellers, and in effect regulate the granting of just and reasonable credit.

"Second—A canvass of the possibility of an export trade of our silks, especially in a period of depression in our own markets. For many years New York was a dumping ground for low prices for excessive stocks of European silks, and would be today were it not for the specific duties enacted by the Dingley tariff in 1897. Turn about is fair play in commercial rivalry, and London and even Paris seem to the far-seeing among us suitable markets in which to try this experiment now.

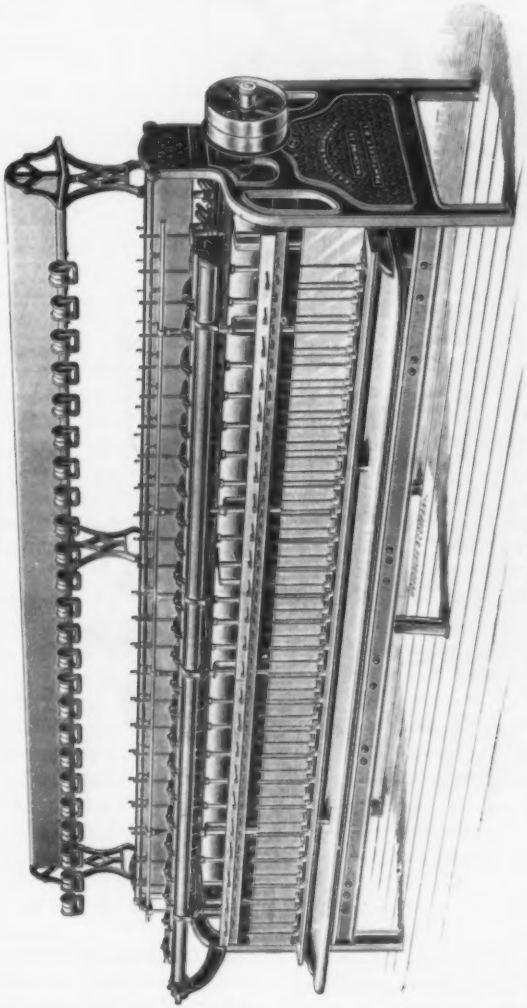
"It is undeniable that with the knowledge of foreign markets possessed by our own commission houses all that is required is concert of action and a well-defined purpose to secure relief to our own markets by distributing our excess of production abroad."

Several interesting papers were read at the meeting, among them being one entitled The Throwing Industry, by George Singleton, Dover, N. J., in which he made several practical suggestions for improvement of trade

conditions in the silk industry; another on the Sewing Silk and Twist Industry, was read by C. E. Gudebrod; and a third, The Ribbon Industry, by Julius Kaufmann; also Piece Dyeing and Finishing, by H. W. Boettger.

A convenient receptacle for bobbins and spools is provided, and the motions of the machinery are all simple, and the parts built in a durable manner.

The bobbin holder built by the



DOUBLING SPOOLER.

Spooling Machinery.

The Easton & Burnham Machine Company, Pawtucket, R. I., are manufacturers of spoolers and doublers, adapted to spool from spinning or twister bobbins, cop or skein, and to doubler from cop or filling bobbin.

The bobbin spooler is constructed with an iron framework throughout. Easton & Burnham Machine Co., has been introduced very generally and over 50,000 are now in operation in different mills.

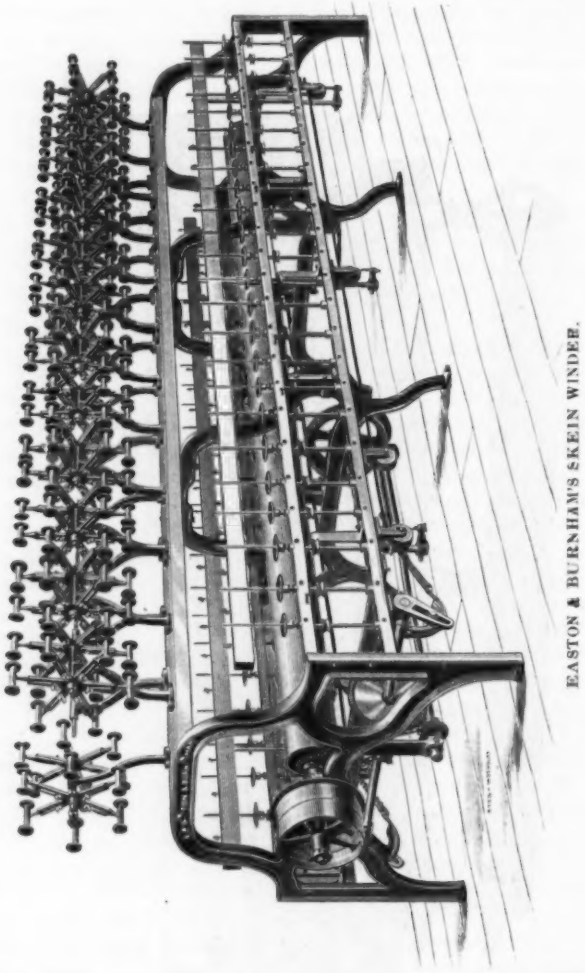
In order to provide for the necessity of some kind of a device for removing bunches, or particles of leaf, from yarn in process of spooling, the Easton & Burnham yarn guide has been placed on the market. While

the manufacturers do not claim perfection for this device, they submit it to manufacturers, believing that it has some advantages that will recommend itself in actual use. In designing this guide, two points were kept in mind: First, to make a guide which could be easily cleaned without spoiling the adjustment; and second, one that could not be easily tampered with.

Their skein winder has the same builder motion as the bobbin spooler. The traverse rail is ⅞ of an inch square steel. The back spindle is single rail and self-oiling. This winder is fitted for either spider, silk or shear swift.

It is now considered by many the best practice to make doubling a separate operation, and the Easton & Burnham doubler has for its distinctive feature the Bosworth patent stop motion. This stop motion is rapid and positive in its action, stopping the spool before the end gets on, and thus allowing single piecing.

A self-oiling front spindle is fastened to a rail, which can turn on its bearings to give any angle of spindle.



EASTON & BURNHAM'S SKEIN WINDER.

To prevent cross banding, two end back spindles are fitted with double whirrs.

This machine, as adapted to double on braider bobbins, in addition to the stop motion for broken ends, has a stop motion for filled bobbins.

Their separator is so built that as the ring rail goes down, the separator goes down also, but more slowly and gradually, closer to a line perpendicular to the length of the bobbin, thus describing a segment of an arc in a vertical direction. The separator blade thus catches the yarn absolutely before the latter has a chance to balloon.

Instead of being straight, this blade has a bend in it which prevents the yarn from whipping around and coming in contact with the yarn from the neighboring spindle. The manufacturers state that when a separator blade is placed in a central position between the rings, the yarn from the bobbin, to which the blade belongs, and also from the bobbin next to it, strikes on both sides of the separator blade.

It is claimed that the new separator obviates this, and by reducing the amount of ballooning, reduces the friction of contact with the blade and the drag of the yarn. Another advantage of this separator, is that on account of the reduction in the length of the blade (2¼ inches) it does not interfere with piecing up the ends, and is out of the way when doffing. It is claimed that no "fly" or particles of cotton can collect on the separator blade or the rod to which the blade is attached.

The Easton & Burnham Machine Company, Pawtucket, R. I., will be pleased to give further information in regard to the various types of machinery manufactured by them.

—The operatives in three large cotton mills at Barcelona, Spain, struck recently as a protest against the introduction of some new labor saving machinery.

Garnetts.

The extended use of wool substitutes has made the garnett machine of more value to manufacturers the past few years than ever before. Its use has extended in many directions; indeed, not only for preparing wool stock, but for preparing batting from cotton, wool or mixtures for mattresses and such purposes, the garnett machine has proved of great value.

The James Smith Woolen Machinery Co. of Philadelphia have improved their garnett from time to time, to keep pace with the growing demands made upon it.

It is usually fitted with the Smith automatic self weighing feed. They have improved attachments for the purpose of manufacturing elastic felt batting from cotton, wool or mixtures for mattresses, stair pads, cushions, upholstery, etc.

Their regular garnetts are adapted for returning to raw state, ready for putting into yarn, all kinds of cotton, worsted and wool thread waste, hosiery clips, yarn waste, etc.

Their garnett picker is especially designed for shredding carpets and opening and preparing stock for carding.

The James Smith Woolen Machinery Co. is one of the few concerns in this country which builds practically a full line of woolen machinery for handling stock from the raw state to the loom, including washers of various lengths and widths, stock dryers, dusters, burr pickers, wool and mixing pickers, rag pickers, automatic self feeders for all classes of woolen machinery, woolen cards and mules, together with auxiliary machinery in the way of power transmission, clutches, etc.

They have recently brought out their "Twentieth Century Card," on which every effort has been expended to make it, as they say, "The Card of the Century" in every particular.

Cotton Press for Round Bales.

The illustrations show a cotton compress recently patented and which is designed to form a round bale from a continuous strip or bat of cotton or similar material; the object is to provide a mechanism which will automatically increase the pressure upon the bale from the initial point in starting the bale until it is finished, and to provide for the ready removal of the bale when compressed.

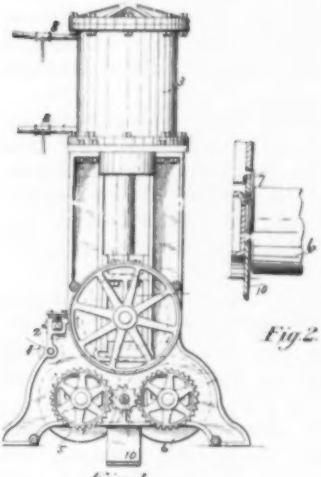


Fig. 1.

Fig. 2.

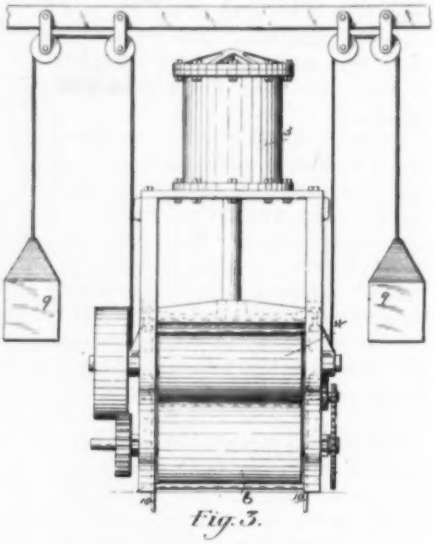


Fig. 3.

A bat of cotton is fed into the machine between the feed-rollers 1 and 2, Fig. 1, which is a side view of the machine.

The device for forming the bat is not shown in the drawings, but any of the well-known methods now in use can be employed. Fig. 3 is a front view of the machine. The cylinder 3 may be filled with compressed air or steam above the piston-head, thus forcing the presser-roller 4 down upon the bat as it passes over the base-rollers 5 and 6. As the end of the bat is turned back between the rollers 4, 5 and 6, it forms a roll or bale, which the presser-roll continuously presses upon with increasing force, owing to the fact that the piston-head is pressed upward against the column of compressed air in the cylinder.

The disk 7, Fig. 2, at each end of the rolls, serves to form smooth ends to the bale, and when a bale of the desired size has been formed, the valves 8 are opened to exhaust the air from the cylinder, when the counter-weights 9 descend and raise the presser-roll from the bale, so that it may be removed. The sliding plates 10 move slightly outward into the grooves as the disks rise, and give a clear space for removal of the bale.

—A recipe for a solution to mark iron or steel is given as follows: Dissolve one ounce blue vitriol in four ounces of water and half a teaspoonful of nitric acid. When this solution is applied on bright steel or iron, the surface turns copper color, and marks made by a sharp scratch-awl will be seen distinctly.

—A recipe for making a lubricant for milling and drilling is given as follows: Dissolve separately in water 10 lbs. whale-oil soap and 15 lbs. sal soda. Mix these in 40 gallons clean water; add two gallons best lard oil, stir thoroughly and the mixture is ready for use.

COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Cost Finding.

Abstract of a lecture delivered at the Lowell Textile School by E. W. Thomas, Agent Tremont and Suffolk Mills.

The subject of "cost finding" is one of an exceedingly important nature. Its importance to the manufacturer, cannot be over-estimated, and in these days of such close competition in the textile trade, it is not only necessary, but absolutely essential that the manufacturer be able to clearly and accurately, establish the exact cost of the goods he places in the market.

The mills making but one kind or grade of goods, say a print cloth mill, or one on standard drills, can determine their cost of goods very easily, as compared with our large plants that are making a large variety of goods, with different organizations and a wide range or numbers of yarns. The same is true of a yarn mill making a large variety of numbers.

It must be evident that the only proper way to consider costs for such large plants, is to take each kind of cloth and treat it throughout as though it were the only kind made at the mill, in so far as labor is concerned.

Much more and closer attention is being paid to the methods of computing costs than ever before, for various reasons, not only among ourselves, but by our Southern friends.

When, years ago, our mills, making but one or two varieties of goods, were forced to, or voluntarily did, increase the kinds of goods they made, then it was, that they found the old methods of obtaining costs were not satisfactory, resulting in the establishing of new methods.

Men who are known to be close and careful calculators of the cost of their goods, do not fear each other in trade, as much as they do the man who "thinks or guesses" at the cost for the latter, often times by quoting too low a price, establishes a price that must be met by other parties, who perhaps know positively that the price thus established is lower than actual cost.

The plan of cost finding I desire to present to you, has this advantage, in so far as mill labor cost is concerned, of being founded on actual facts, as existing, and nothing is assumed, so that this portion of the work can be absolutely worked out.

To start with, all overseers or department men should be required to work out a monthly cost sheet from their weekly pay roll. I say "should be required," advisedly, believing and knowing from my own personal experience, that such requirement of an overseer makes him more proficient in, and gives him better knowledge of the smaller details of his department.

Now to start with, the pay roll of any room ought to be sub-divided into sections, for example, in a card room, the names of the grinders ought to be together, so that the total amount paid for grinding may be seen at a glance. Then put all strippers' names

together, and each class of operations by themselves. Each number of roving should have the operatives' names who worked in separate sections. Other departments should be controlled accordingly.

The cost for the general help of the room including the overseer, second hand, fixers, oiler, scrub, roving men, elevator hand and any others whose duties are not confined strictly to any one class of machines, should be separated.

In the pay rolls of the mule spinning rooms, spinners' names ought to be together, with the amount of yarn spun or hanks produced by each. Doffers' names under another head, back boys under another, and general room help under another. Following this system in all pay rolls.

Now the advantage of this is shown by the collecting of the various amounts of each week's pay roll, into the monthly account sheet. This matter I will deal with later.

Naturally, an overseer is somewhat averse to paying any attention to this matter of figuring out his costs, and considers it of little value. Well, let us see; take two mills on the same class of goods, and similarly fitted up with their machinery. The manager of one requires this system to be carried out by his overseers, and from the reports handed him each month he is enabled to know just what each number of roping, each number of yarn, each kind of cloth, costs; he can make comparisons, one month with another, one six months with another six months; he can keep in close touch with production and cost of same; he can by this system follow back and locate in the room and in the operation, where any increase or decrease in the cost exists; his overseer can tell him just what each number of roping, each number of yarn costs; and in the card room, they will be able to tell just what carding costs per pound, what the operation of drawing costs, what each number of roping costs per pound; they are on the alert to find out whether they are producing cheaper per pound than some other overseer in a like department.

Now, in the other mill, where the responsibility of making up costs is taken from the overseer (I mean now his own individual labor costs), and the same are made up by some one else from the ordinary pay roll and the ordinary report of the production, it seems to me almost impossible for correct costs to be obtained; it also seems to deprive the overseer of a certain amount of information they should possess, which from lack of interest is to them an unknown factor.

Comparing the overseers of these two mills, would you not say, without hesitancy, that if you were manager of a mill, that all other things being equal, you would select an overseer who did know about the cost of production?

Now the application of all this is "up to you" as the boys say. It seems to me that it is one of the most important questions you can take up for consideration, comparison, and discussion in the Textile association.

The man, be he manager, superintendent, overseer or second hand, who thinks he can keep all the secrets of manufacturing and costs locked up in his desk, or written in a book conveniently tucked down his coat pocket, only to be looked at in the privacy of his office or in the quiet of his home, is generally the man who knows everything, whose ways and methods are the only ones, and who rejects the opportunity of learning more than his own combined experience.

He is the man who does not grow, who wants to dictate or personally make all changes in his room, for fear his second hand or possibly fixer, may find out something. Happily now for all concerned, this type of man is rapidly disappearing. In every official and employer holding position, more is required of practical knowledge than ever before.

It seems to me, speaking as I do to practical men, that the matter of industrial education should be one of

your foundation stones. By this I mean, that if you are in a cotton mill you should employ every means to thoroughly post yourselves in all that pertains to cotton in all its phases, to the construction and operation of all machinery connected therewith.

Your value to your employer is measured by your ability and capacity. You are employed in one of the great spheres of industry which is very peculiar in itself. Did you ever stop to consider how little we know about cotton, its make-up, how it grows, and why some cottons are so much harder to work than others?

The field for instruction and of obtaining knowledge in this art is wide, and has not been explored to any extent. We have seen other industries grow, improve, and change their processes of manufacture, but we as workers in the cotton mill have seen but little actual improvement in comparison with the magnitude of industry.

Mechanical improvements have been made and it is certainly true much better machinery has been introduced, but with the exception of the magazine loom, no radical reductions in cost of manufacture have been made, proportionate to the growth of the industry.

The introduction of steam power into the manufacturing world, drove the little blacksmith shop, the shoe shop, hand spinning, and the weaver's loom, from the isolated village to the busy industrial centre, and opened up new problems. In this, long ago, the small workman found it paid to consider the physical, mental, and moral welfare of his apprentice or assistant. If it paid the small employer, and said employer was benefited by advice and instruction, so much the more should the employer of large numbers of people, urge them to take every means of improving themselves. And in doing this all are benefited.

Michael Angelo on pointing out several alterations of detail in a statue was met by the explanation, that the changes he suggested were but trifles. "Ah," he replied, "trifles make perfection, and perfection is no trifle." The principle he illustrated is applicable to us all in any position we may occupy.

You established but a few weeks ago an association, whose scope is unbounded. If you could realize as I do and others do, the great advantages that might come to you as a great, strong organization, every member of which was seeking for information, your example would be followed by every mill centre of the United States.

Robert Burdette, in his advice to young men, says: "You take a basin of water, place your finger in it for 25 or 30 seconds, take it out and look at the hole that it left. The size of that hole represents about the impression that advice makes on a young man's mind." Now I trust you are not in that condition, but will accept the advice I have given and strive to make this association of yours, one that will command the respect of your employer, your friends, the public, and yourself.

Several subjects relating to this Department have been treated in the Questions and Answers Department of this issue.

Breakage of Yarn in Spinning.

This is a very important question, and one which should receive more attention than it does at the present time: Among the factors to be considered are the speed of spindles and rolls, size of ring, length of traverse, amount of draft, kind of stock used, whether single or double roving, and general conditions of room and machinery. I have made a great many trips around the spinning room, and counted the ends down. On these excursions, I have taken notes and kept a careful record of the number of ends down on the various kinds of stock and sizes of yarn; from these notes I have based the following estimate of what would be a fair allowance for ends down on various kinds of work.

From	20's to 40's	10 to 15	ends	per	thousand.
"	40's to 60's	15 to 20	"	"	"
"	60's to 70's	20 to 25	"	"	"
"	70's to 80's	30 to 40	"	"	"

I should like to hear from other overseers on this question. An exchange of views on this subject cannot fail to be beneficial, and will aid overseers of cotton spinning rooms to determine whether their work is running as well as it should.

MOHAWK.

Stripper for Revolving Top Flat Cards.

A U. S. patent has been granted for an English device for stripping the revolving flats of carding machines.

The inventor states that hitherto in carding-engines with revolving flats, the waste fibres or strips have been removed from the card-teeth of the flats by a comb or card having an up-and-down or oscillating movement imparted and reciprocating in the same path over the surface of the card-teeth.

In practice it has been found that this motion often damages the teeth of the comb and flats, owing to the flats being pressed from the periphery of their blocks or discs by particles of dirt or flyings entering between the ends of the flats and the blocks or disks, or owing to the flats hanging loosely from the latter through the elongation of the chain-links of the flats.

The object of the new device is to provide means by which these defects are obviated and the cards are combed or stripped more effectively than heretofore—namely, in the direction of the angle of the card-teeth on the flats, rendering it very easy to draw the waste fibres from clothing.

These objects are attained by the mechanism shown on the illustrations.

Fig. 1 is an end view, Fig. 2 a sectional plan, and Fig. 3 a diagram of the stripping motion. A is bolted to the outer side of each bend, carrying the discs which support the flats, and at each of these brackets a bearing is

Fig. 2.

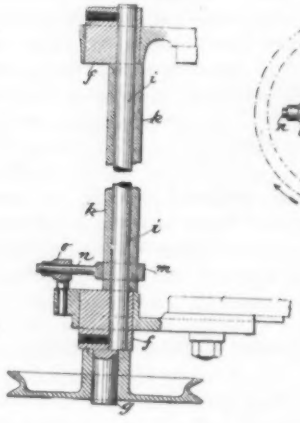


Fig. 1

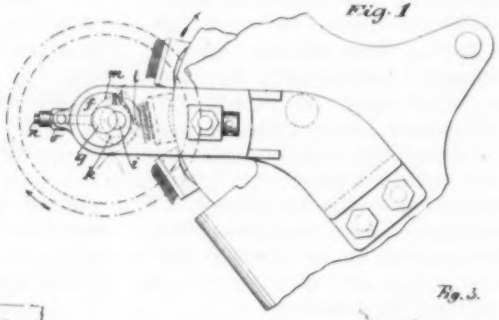
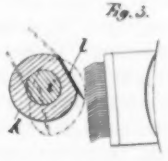


Fig. 3.



fastened, formed of two parts, the outer one of which is adjustable, as shown in the illustration. In each of the outer parts there is mounted a cylindrical body (F), one of which is formed with a stud (G), to which is attached a rope pulley, for operating the device. To these discs (F) is secured a shaft (I), which connects them to form a double crank, upon which is placed a tube (K).

The comb (L) is attached to this tube on discs operating the comb in crank fashion. At one end of this tube is fastened a ring (M), having an arm (N), the free end of which works in a socket (O), so that the otherwise

circular path of the teeth of the comb is changed into an irregular one, resembling an ellipse. The form of this ellipse is shown by the dotted line in Fig. 3. Set screws are provided in the ring (M), by which the comb can be adjusted, so that the teeth can be set at any required angle to the card teeth.

Several subjects relating to this Department have been treated in the Questions and Answers Department of this issue.

Improved Cop Winding Device.

A device for winding on cops, has been patented in England. It aims to cross-wind the yarn so as to bind the cop more firmly together, and prevent breakage during weaving. The thread is guided during the winding process so that it doubles back on itself several times while passing from the base to the point of the cone, and in this respect resembles the cop wound on the hand mule; the crossing is regular, however, while the crossing by the hand spinner was necessarily irregular.

Carding Cotton.

Editor Textile World:

I have read with much interest, the articles in the January issue, on carding cotton, and will give you my experience in this department.

The following points may be mentioned as being very important factors in carding cotton: (1) A true and well balanced cylinder. (2) It should be covered with good sheeting before being clothed. (3) Use as good leather for sheets as is used for the card clothing. (4) When clothed with sheets draw as hard as the leather will bear. (5) Clothe the doffer with the best cloth, with about 36 pounds strain. (6) Grind lightly. (7) Set the doffer as close as it will run to the main cylinder.

Do not use a 60th of an inch gauge, but put your cylinder up and then run it backwards. At the same time, turn the doffer with your hand, and set it so you can hear it clip the cylinder; No. 30 to 32 steel needle point wire is generally used for the cylinder, with from 41,500 to 55,200 points per square foot. A number 33 wire, with 57,520 points per square foot will be about right for the doffer. Tempered steel wire is probably the best for breaker cards. The most serious drawback with steel wire clothing, is the liability of fire when ground.

The wire on the top flats should vary from 28 to 33. The first five tops should have 28 wire; the next two, No. 30 wire; and, the remainder, 32 to 33 wire. This will give from 34,000 to 51,000 points per square foot. For the cylinder doffer, I should not advise No. 33 wire. The wire commonly used for the cylinder is No. 32, with 72,000 points, plough ground. This makes the point much finer.

The above suggestions are based upon my experience, which has been on fine work. ELI.

Analysis of Grey Cotton Cloth.

Grey cloths will need to be examined for, 1st, such substances as starch, flour, tallow, and other fatty bodies; 2nd, insoluble weighting materials, like barytes, mineral white, china clay, etc.; and 3rd, soluble mineral salts, like magnesium chloride, zinc chloride, Epsom salts, Glauber's salt, etc.

Moisture: To determine this a piece of the cloth weighing 5 grammes is placed in a hot-air oven and kept at a temperature of 220° F. until it is quite dry. On weighing twice at intervals of an hour it is found to have lost weight. Generally a piece of cloth will contain 7 to 8 per cent. of moisture. If the moisture is found to exceed this then the proportion of water becomes excessive and may be due to the presence of hygroscopic substances like magnesium chloride or zinc chloride, which keep the cloth abnormally wet or moist.

Mineral Matter: Five grammes of the cloth are placed in a porcelain, or better, in a platinum basin, which has been previously weighed, and heated over a Bunsen burner until all the black carbonaceous matter has been burnt and nothing but a white ash is left behind. A pure cloth will not leave more than one per cent. of mineral matter, so that any excess over this amount represents weighting matter of some kind or another.

Fatty Matter: The 5 grammes of cloth dried in the oven are put into a Soxhlett fat extractor with petroleum ether, and the fat is extracted in the usual way. The petroleum ether is next placed in a weighed beaker and the ether evaporated off (first on a water bath, second on the air bath), and the residual oil weighed. It will be necessary to examine the residual fatty matter to see if it contains any paraffin wax and saponifiable fat or oil, such as tallow and cocoanut oil. This is done by adding to the residue in the beaker 25 c.c. of an alcoholic solution of caustic potash, boiling up for ½ hour, mixing with warm water, transferring the mixture to a separating funnel, adding a little petroleum ether, shaking well, running off the aqueous layer, washing the ether layer with hot water, and then rinsing it into a weighed beaker; on evaporating off the ether any paraffin wax is left behind.

Fibre: The cloth from the Soxhlett extractor is boiled with water from 20 to 30 minutes, after which it is well rinsed in water, steeped in a solution of malt extract for 2 hours at about 130° F., and washed well. It is next boiled for one hour in a solution of one gramme of caustic soda in 100 cubic centimetres of water, rinsed well, next steeped in a hot solution of one gramme hydrochloric acid in 100 cubic centimetres of water for one hour, washed well with clean water, dried at 220° F. in the oven, and weighed.

The Mineral Matter: Twenty grammes of the cloth are boiled in 500 cubic centimetres of water containing 10 grammes nitric acid for about ½ hour, and the cloth well squeezed. It is again boiled 2 to 3 times with clean water until practically all the soluble matter is washed out of it. All the liquors are mixed together and filtered through a piece of filter paper, and the insoluble matters—china clay, barytes, or mineral white—separated out; these are dried, burnt in a porcelain crucible, and weighed. The filtrate is boiled down to a convenient bulk and aliquot portions of it taken; any zinc, calcium, magnesium, sodium, hydrochloric acid, or sulphuric acid it contains are determined in the usual way. The presence of starch can be ascertained by boiling a little of the cloth with water and adding a few drops of iodine to the solution, when, if starch be present, a deep blue color will be produced.

Regarded from the point of view of the bleacher and the effect the various bodies enumerated above have on the bleaching operations, says the Textile Mercury, it may be stated that any flour or starch has no material influence; they only serve to increase the pollution of the waste waters.

Tallow, cocoanut oil, or similar fats, use up more lime or alkali because they are converted into soap, and in so far they prevent the proper action of these alkaline agents on the natural fats of the cotton, and more of them must be used.

When there is much paraffin wax present some may escape being removed, and if so it is likely to lead to the production of yellow stains on the cloth and uneven dyeing when the cloth is dyed after bleaching. The insoluble mineral matters (barytes or mineral white) simply act mechanically and do not materially affect the quantity of the chemicals required to bleach, but the cloth requires more washing when they are present than when they are absent.

Speed of Warpers.

The speed of warpers depends upon so many different things, that every department in the mill could be treated in an article on this subject without in any way digressing from the main point. Even with the same kind of machine, same size of yarn, and same temperature and humidity, the speed can not always be the same, on account of the varying conditions under which the material has been treated in the preceding processes.

There is quite a wide difference in the practice in different mills in the early processes. Some employ much lighter drafts than others, drawing the roving oftener, and handling the fibres much more gently, and in this way there is a minimum quantity of strain or broken fibres when the finishing roving is taken to the mule or ring frame; when warping yarn, made

ORIGINAL DESIGN FOR QUILTS. DESIGNED FOR THE TEXTILE WORLD BY T. HENDRY, PUBLIC DESIGNER.

in this way, it will be found that the speed can be much higher.

In addition to this, there is the harsh treatment which the fibres get when treated by old worn out and worthless machinery, such as old cards with wire in poor condition, railway heads that look and work as though they belonged to the antediluvian age, drawing and slubbing frames and speeders to match, with rolls out of line on account of the worn necks, crooked rolls, and all the other paraphernalia belonging to played-out machinery; spinning frames running at much too high a speed for the quality of the roving and condition of the frame, yarn battered out of shape against the separators, spoolers that should have been on the scrap heap years ago, warpers with creels all out of shape, part of the steps gone, skewers all gone, and no two spoolers anywhere near the same weight. All of these things may be mentioned as having an influence upon the speed at which the warper should be run, and yet, in spite of this, some superintendent or agent will come around and say to the overseer: "I was in a mill the other day, and they run their warpers 50 or 60 yards per minute quicker than you run yours. Can't you speed up here?"

A man can run his warpers at a somewhat higher speed when he knows his beams are running on the heavy side of the standard. If he finds the beams on the light side, it will be better to run a little slower. For instance, I have run warpers on 22's yarn with an 18-inch cylinder, 43 revolutions per minute, when the yarn was inclined to be tender. This speed gave about 68 yards per minute. I have also run a machine 47 revolutions per minute, producing about 74 yards in the same time, and on rare occasions I have run them 52 revolutions per minute, which gave 82 yards in the same time. These speeds were on the same size of yarn, same roving, draft, and machinery, but with slightly varying degrees of temperature and humidity. Under fairly good conditions, I have run 13's yarn as high as 58 turns per minute, with an 18-inch cylinder, and in these instances having to turn a spool weighing nearly two pounds.

My experience on the finer grades of yarn has taught me that such work can be run faster than can the coarser numbers. This is contrary to the general idea, but with fine numbers the spools are not nearly as heavy, and generally the creels are better adapted to the work, giving less friction. At the same time, the grade of cotton is much better. It has a longer, finer, fibre. Frequently, the 60's yarn is combed, and when not combed is double carded, well prepared in the early processes, and made from good American or Egyptian cotton. The 80's yarn is always combed stock, and, of course, is the best Sea Island cotton.

When running on fine work, it is necessary to adjust the barrel of the beam so that the yarn will not pass on to the empty beam at too acute an angle. For 80's or 100's yarn, I prefer a barrel 12 inches in diameter.

SPINNER.

—The metric system has been adopted by Russia as the official standard of weights and measures. This movement towards adopting this decimal system has now gone so far that but little doubt exists that it will finally be the world's system. Its final adoption by all countries will end the present babel of tongues, and give to weights and measures a universal language.

—Life, it is the art of employing our time.—Balsac.

—Often one forgets a favor received because the grantor remembers it too well.—Malesherbes.

—Eccentricity is the caricature of originality.—Guinot.

—We can accustom ourselves to being without money, but never to the idea of having it no more.—Dumas.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Finishers' Difficulties.

As a rule, difficulties originating outside of the finishing room can best be corrected in the department where they arise, though some demand special care and treatment in the finishing room. At all events, the finisher is expected to bring the goods out as nearly perfect as possible, and to do this entails upon him the double duty of having his eyes open to faults in both his own and other departments which have an influence upon his work.

Difficulties in the finishing room, often come when least expected, and sometimes disappear before their cause can be determined.

One of the troubles which almost every finisher has at times to deal with is that of cockled cloth; while it is made distinctly manifest in the finishing department, the cause may or may not be due to any fault in the finisher's method. In fact, it is more frequently traceable to some other department, and there is hardly a department in the mill that is entirely free from a possibility of causing the trouble.

There are three conditions that may cause cockles to originate in the finishing room. If the fulling soap is not sufficiently strong to thoroughly saponify the grease in the goods, the fulling must be imperfect. In places where the grease has been overcome, and its effect destroyed, the fulling will proceed, while it will be retarded where the saponification has not taken place, or is imperfect.

This of course results in irregular fulling, and the cause can only be removed by adding to the fulling soap a sufficient amount of alkali to render its action perfect and complete.

Another cause for cockles may be in the lack of a sufficient soap. If there are parts of the cloth that are not sufficiently wet, they will fail to full, while the parts that are wet are favorably affected, thus producing an irregularity.

A third cause, which is somewhat similar to the second, is the careless application of the soap, by which, even though the quantity be sufficient it fails to go on to the cloth evenly, and the parts that are wet first get the start of the places that become wet later, thus producing an irregular width which the after fulling may not fully overcome. The finisher should therefore see to it, that his soap is equal to the requirements, and that the soaping is carefully and intelligently done.

It would be impossible to designate all the things in the other departments that would cause cockles. But it is plainly evident that anything that could in any way produce uneven fulling might be responsible for them. Following are a few of them. In the picker room, any irregular mixing of long and short stock, or wool and cotton, by which some portions of the filling yarn would have more of the good stock than other portions. Any irregularity, either in the size or twist of the yarn, and we may here say that this suggests the importance upon some kinds of work, of keeping top and bottom spools from the cards, separate, and using the yarn separately; careless steaming of the filling yarn, by which some may become

saturated with water, causing irregular weaving, will sometimes cause trouble. A variation in the weaving by which the cloth may vary in weight, having heavy and light places; this may occur from the carelessness of the weaver or from an irregularity in the take-up of the cloth, or the friction or let-off at the warp beam; or sometimes a beam that is crooked or with a sprung shaft will cause an irregularity in the cloth.

All of these possible causes make it nearly impossible for the finisher to at once locate the cause or to apply the remedy. But he should be able to determine whether the trouble is in his department and act accordingly.

Cockles caused in the finishing room are usually irregular and the wrinkles caused by them, more pronounced in the middle than on the sides of the cloth, while if caused in the other departments, the wide and narrow places will show equally all across the cloth, the changes being abrupt, from wide to narrow, and often in spaces indicating one or more bobbins of filling, or at uniform intervals, corresponding with the revolutions of the warp beams.

In the matter of the oil used upon the stock in carding, the manufacturer cannot be too careful to secure a good oil and avoid frequent changes. The manufacturer is sometimes too ready to try experiments, and by getting into the works, two or three kinds of wool oil, each of which would require a different strength of soap, and gives the finisher the impossible task of producing uniform results with a soap only adapted for one of the oils in question.

By a proper adaptation of the soap, and a careful application of the same, together with a prompt report when it is discovered that cockles are caused by faults in the other departments, the finisher will have done his duty regarding them.

Another trouble which the finisher has sometimes to contend with, is mill wrinkles, or wrinkles made in the fulling mills, and becoming felted so that they cause an imperfection in the finished fabric. As a rule, these wrinkles occur near the ends of the cloth usually being the most pronounced on the end that enters the mill first.

Careless sewing of the ends, by which the seam is irregular, or the stitches too long, will produce wrinkles; and often their extent into the cloth is in proportion to the irregularity or length of the stitches. Fine and uniform sewing, or what is better, the use of a mill sewing machine, will remove this cause.

The weaving of headings in the ends of the cloth, of yarn that fulls faster than the body of the piece, will cause the cloth to wrinkle, on the same principle that narrow places in cockled goods will produce them; and where the wrinkles remain in the cloth during the fulling, they produce felted streaks. It is best to have no headings woven in the cloth, unless it be of yarn of less fulling quality than the regular filling.

Should the mill wrinkles occur in the body of the piece, without reference to the ends, the only remedy is a frequent overhauling or opening of the cloth to change the folds in it before they become set or felted.

If the cloth is not intelligently designed, or "laid out" in the loom, and the warp threads are crowded or out of proportion to the filling, mill wrinkles will result, in spite of the finisher's best efforts, especially upon goods requiring several hours' fulling.

Anything that tends to open the cloth on its passage from the rolls to their entrance again, or otherwise to change the folds, will obviate the trouble, and in this matter there is an opportunity for an improvement in the modern fulling mill.

Rolling selvages are usually due to something not under the control of the finisher. Frequent opening and shaking them out, or sewing the edges of the cloth together, with the side toward which they roll outward, so that in their tendency to roll they are holding each other from it, are the

only remedies for the finisher. Further corrections must be made in the yarn or weaving.

Cloth with a predominance of filling on one side, will tend to roll toward that side, and the trouble is intensified by the open or loose character of the weave. If the selvages are made in the loom tighter, or of stock that will shrink faster, and in consequence become tighter than the cloth, they will at once begin to roll, and the only remedy is a change, either in the yarn or the weave of the selvage, to make it slacker or less inclined to shrink.

Sometimes, when the selvages are all right, the leaving out of a broken warp thread in them, or a wrong draw, will expose the filling, causing a shrinkage at that point, that will turn the edge of the cloth and produce the trouble. It is too often the case that the weaver fails to understand the importance of perfect selvages, and they go to the finishing room in all kinds of conditions, giving the finisher trouble in fulling, gigging, shearing and pressing, and often resulting in their destruction, despite his best efforts to save them.

The result of rolling selvages, is a more compact and heavier felt on the sides of the cloth, owing to the increased warmth at that point in fulling; so that it is quite impossible to produce a uniform finish, even if the finisher succeeds in opening out the cloth in the last processes of his work.

Dirty goods: This is a serious difficulty, and demands more space than this article will allow. One important thing, however, which is too often overlooked, is the fact that the fulling is, or should be considered a part of the scouring process, and serves as such when it is correctly done. As a rule, where goods are not properly cleansed, the fault is as likely to be in the fulling as in the scouring.

If the saponification is imperfect or incomplete in fulling, the heat produced in the process tends to set the grease, making it harder to remove in scouring.

If the saponification is perfect, it converts all the grease into soap, and though in a dirty state, if of sufficient body, it holds all the foreign matter until the scouring follows to complete the work.

There are many difficulties in the dry finishing that are the direct result of a failure to properly clean the goods, hence the battle is largely won by thorough work in the wet department.

Crooked plaids or checks are sometimes made worse by uneven or very slack selvages; but good results can only be assured by care to keep them as nearly straight as possible in drying and on the press.

There are minor difficulties in various parts of the work that are the direct result of those already referred to, which a proper care, as suggested in this article will obviate.

The whole of finishing should be governed by good judgment as well as constant watchfulness, to avoid the various difficulties that arise.

Several subjects relating to this Department have been treated in the Questions and Answers Department of this issue.

Prevention and Removal of Washer Wrinkles.

A manufacturer of ladies' half-wool dress goods, who is troubled with washer wrinkles in his goods, is advised by a writer in the Berlin Textil-Zeitung to try the following methods:

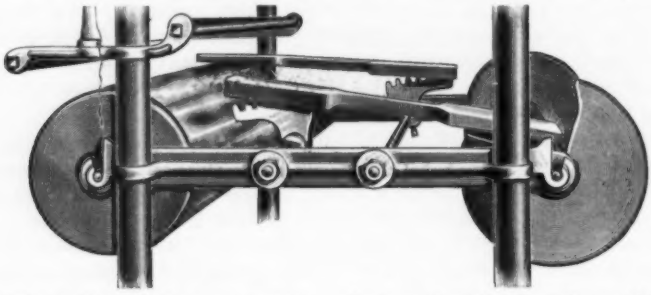
1, If the color will permit, give the goods a good crabbing or steam blowing before washing; 2, remove the goods from the washer from time to time and fold them over so that they will run in different folds when put back into the machine; 3, fold the goods on a table occasionally during the washing, and at the same time stretch them out widthways; 4, use a small guide eye for the goods to pass through so that the goods will be squeezed tightly in the string or roll; 5, in case none of the preceding

means prove effective, pass the goods through a second small guide eye in front of the washer roll. These guide eyes should be arranged and shaped in such a manner that the folds will be changed in passing through the regular and extra guide.

Washer streaks, if not too strong and if the color will stand the treatment, can be removed by winding the goods while wet on rolls, and letting them stand in this condition for from six to twelve hours.

An Improved Dresser Spool Rack.

One of the most important points in connection with sectional warping of woolen and worsted goods is the arrangement of the spools. Formerly, they were arranged in two upright rows, side by side, and the threads from each row of spools formed one-



half of the section; if for any reason the friction on one spool varied causing the threads to be slacker or tighter than the others, section streaks result by reason of contrast with the other half of the section in which these slack or tight threads did not appear.

Every manufacturer is familiar with this difficulty. In a 6/4 piece of goods, dressed with eight sections, each section would cover about seven inches of the finished cloth, and the tight or slack spool on one side of the section would cause a corresponding streak about 3½ inches wide, and appearing every seven inches across the goods. This particular difficulty was remedied by placing the rows of spools behind each other instead of side by side; the ends on each spool would in this way spread across the entire section, and any variation in the tension on particular spools would not appear in the goods unless the difference was very marked, as the whole section would be alike; i. e., assuming that the variations began with the first section and continued throughout the whole warp.

This arrangement was accompanied by an inconvenience in carrying the yarn from the rear spool past the front one. There was not sufficient room for the operator to work easily, and, consequently the production of the machine was diminished.

It is to remedy this difficulty that the Worcester Warp Compressing Company have recently brought out the spool rack shown in the accompanying illustration. The friction device is so built as to take up the least possible amount of space, and the operator can look after the spools and piece up threads as easily on this rack as by the old-fashioned method of placing the rows of spools side by side.

In addition to this advantage, the friction device which is shown in the illustration possesses the great merit of gradually reducing the friction as the yarn runs from the spool. It is well known that much more friction is required when the spool is full than when nearly empty, owing to the greater ease with which the spool is turned by the strain on the yarn in the former case than in the latter. The gradual reduction of this friction is effected by the gear rack shown in the illustration. As the spool grows smaller, the lever drops down, bringing the point at which it rests on the rack nearer to the spool, and, conse-

quently, according to a well known law of mechanics, reduces the pressure of the lever on the spool.

The levers are made of iron, and there is no necessity of using weights on them. These weights take up a great deal of room, and it is owing to their removal that this device gives so much more working space.

In the illustration, both a full and empty spool is shown. The full spool shows the tension lever resting on the extreme end of the section gear. The empty spool shows the lever rising on the barrel of the spool, and the inner edge of the gear. The manufacturers claim that by the use of this device a uniform tension is maintained on all the spools, and the difficulties resulting from irregularity in this respect are avoided.

The rack occupies very little room, the distance from centre to centre of the spools being 26 inches. It is built in sections, so that a rack can be made for any desired number of spools. The yarn on the rear spool is passed between two light running rolls, so as to keep it from interfering with the front spools, and a missing end can be readily detected by the operator. The yarn is taken from all of the spools in the same direction, that is as regards the position of the tension lever. The levers can be adjusted to rest upon any part of the spool desired; this results in more room being afforded for the operator. The Worcester Warp Compressing Machine Company, Worcester, Mass., will be pleased to give any further information in regard to this device.

Several subjects relating to this Department have been treated in the Questions and Answers Department of this issue.

—Sixty years ago, says the president of the Belfast, Ireland, Chamber of Commerce, there were 1,000,000 flax spindles in England, Scotland and Ireland, each of these countries then having about one-third of the whole number. Today England has practically no flax mills, Scotland very few, while there are 828,000 spindles in Ireland; the total for both Scotland and Ireland will barely reach the number in the three countries sixty years ago.

Cloth Analysis.

When a sample of woolen or worsted cloth that a commission house firm or mill owner desires to have reproduced is received at the mill, one of the principal items to be ascertained at the beginning is the weight per yard, in ounces, for a given width of cloth.

Fifty-four inch, or 6/4 yard is the standard for men's wear fabrics; but one or more inches are generally allowed to the merchant for shrinkages, so that 6/4 goods are delivered from 54 inches to 58 inches wide, although 55 inches finished cloth is the width generally made.

In ascertaining the weight per yard the calculation has to be done in most instances from the weight of a very small sample, say one square inch, or four square inches. To cut the cloth to a certain size the best plan is to cut or stamp it out with a die, because there is here the least liability of error. Another good method of cutting the cloth is as follows: place a piece of ordinary glass cut to the required number of square inches, over the cloth; hold this firmly with the left hand, and cut around the edges of it with a razor or very sharp knife. This method has an advantage over that of cutting with the die, namely, that the person cutting the cloth can see to cut parallel to the ends and picks, thereby leaving the cloth in a perfect condition from which to count the number of ends and picks per inch which are other items subsequently required.

The accompanying list of widths and weights, tabulated by a designer in one of the foremost woolen mills in the country, and by him used for many years in practical work, will serve to show at a glance the weight

of a yard of cloth in ounces, from 55 to 57½ inches wide, from the weight in grains of one square inch of cloth. If four square inches are weighted the weight per yard will be one-quarter of that indicated along the line for one square inch. If more than one square inch of cloth is weighed the following formula or rule may be adopted to find the weight per yard from any given number of square inches.

[Weight in grains × width of cloth in inches × 36 (inches per yard)] ÷ [Number of square inches weighed × 437.5 (grs. per oz.)] = ounces per yard. LEWM.

GRAIN TABLE.

Showing the weight of a yard, in ounces, from one square inch of cloth.

GRAINS.	Inches wide, 55	Inches wide, 55½	Inches wide, 56	Inches wide, 56½	Inches wide, 57	Inches wide, 57½
1/16	.28	.29	.29	.29	.29	.30
1/8	.56	.57	.58	.58	.59	.59
1/4	1.13	1.14	1.15	1.16	1.17	1.18
1/2	2.26	2.28	2.30	2.32	2.34	2.37
3/4	3.39	3.43	3.45	3.48	3.51	3.55
1	4.53	4.57	4.61	4.65	4.69	4.73
2	9.05	9.13	9.22	9.30	9.38	9.46
2 1/16	9.33	9.42	9.51	9.59	9.67	9.76
2 1/8	9.60	9.70	9.80	9.88	9.97	10.05
2 1/4	10.18	10.27	10.37	10.46	10.55	10.64
2 1/2	11.31	11.41	11.52	11.62	11.72	11.83
2 3/4	12.44	12.55	12.67	12.78	12.89	13.01
3	13.58	13.70	13.82	13.95	14.07	14.19
3 1/16	13.86	13.99	14.11	14.24	14.36	14.49
3 1/8	14.13	14.27	14.40	14.53	14.66	14.78
3 1/4	14.71	14.84	14.97	15.11	15.24	15.38
3 1/2	15.84	15.98	16.12	16.27	16.41	16.56
3 3/4	16.97	17.11	17.28	17.43	17.59	17.74
4	18.10	18.26	18.43	18.59	18.76	18.92
4 1/16	18.39	18.55	18.71	18.88	19.06	19.22
4 1/8	18.67	18.83	19.01	19.18	19.35	19.52
4 1/4	19.23	19.40	19.58	19.76	19.93	20.10
4 1/2	20.37	20.54	20.73	20.92	21.10	21.29
4 3/4	21.50	21.68	21.89	22.08	22.28	22.47
5	22.63	22.83	23.03	23.24	23.45	23.66
5 1/16	22.91	23.11	23.32	23.53	23.74	23.95
5 1/8	23.19	23.43	23.61	23.82	24.04	24.25
5 1/4	23.76	23.97	24.19	24.40	24.62	24.84
5 1/2	24.89	25.10	25.34	25.57	25.79	26.02
5 3/4	26.02	26.24	26.49	26.75	26.97	27.21
6	27.15	27.40	27.64	27.90	28.14	28.38

Combined Carding and Spinning Machine.

The accompanying illustration shows the machine which has recently received so much notice in both the home and foreign press under the name of the Drury spinning machine.

Its principle is the same as that of the ordinary side drawing on a woolen breaker card, where the stock is stripped from the doffer, and then drawn sideways in the form of a roll or sliver through a pair of rolls; after coming from the rolls, twist is imparted by a tube; and the sliver is then ready to be carried to the next

carding machine. This device is familiar to every one who has ever examined the operation of a breaker card.

The same principle has been applied in the Drury or Cupers machine to a finisher card; but in place of drawing the stock from the entire width of the card into one strand, a number of narrow ring doffers are employed from each of which the stock is stripped by the well-known method used on breaker cards, and which we have just described.

The original patent issued in 1894 to Nicolas Cupers, a resident of Weert, Netherlands, called for a drawing and twisting device on each side of the doffer, as shown in the illustration, Fig. 1. The twist was put in the strand, 5, by the revolving disks, 7, 7; 6, 6, are the drawing rolls; 2 is the comb; and 4 is a roll for supporting the strand as it comes from the doffer; 1 is one of the narrow doffers on the finisher card.

The sliver passed through an oval hole in the revolving disk, 7. It was found that this twisting device was not sufficiently positive, so small belts were substituted; the belt was run over carriers in such a way as to bring the inside surface in contact; the sliver was passed between these surfaces, and thus received the twist.

Unlike the breaker side-drawing, the twist is given to the sliver before it reaches the drawing rolls; this enables the sliver to be twisted to better advantage, as the end which is next to the card can be revolved freely, thus avoiding the false twist which would otherwise result from such a device.

In place of the comb the stock is sometimes stripped by a wire. The completed thread passes from the rolls to a winding drum, where each strand is wound on a separate spool. This necessitates rewinding the yarn ing it, if intended for warp.
ing it if intended for warp.

It is evident from the preceding description that the stock cannot be drawn, but must be twisted as it comes from the card.

But one drawing device is now used on each ring, as it was found that two, one on each side, were not feasible, owing to one side taking more stock than the other.

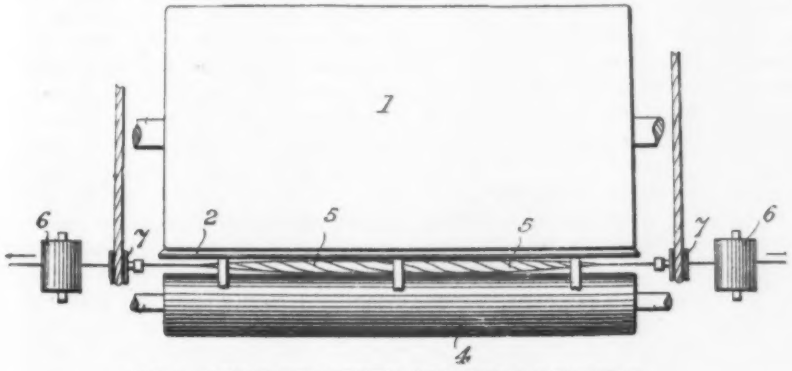


FIG. 1. COMBINED CARDING AND SPINNING MACHINE.

—Austria and the United States are the only two countries whose exports exceeded the imports in the year 1900. The following table, from Der Leipziger Monatschrift fur Tex. Ind., gives the figures of imports and exports for seven of the principal nations, in millions of marks, also the percentage of imports and exports for each country.

	Imports.	Exports.	% Imp.	% Exp.
Great Britain	10,698	5 954	64	36
Germany	5 557	4,414	56	44
United States	3,482	6 208	36	64
France	3,527	3,262	52	48
Belgium	1,696	1,438	54	46
Austria	1 431	1,625	47	53
Switzerland	859	656	56	44

KNITTING DEPARTMENT

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The Knit Goods Situation.

At this time last year it would hardly have been possible to conceive of such a state of demoralization as has existed in the underwear market during the past few weeks. In February of 1900, practically all of the reputable mills were filled up with orders for fall and were running on full time, but this season, even at this late date, many of the mills, have still a large part of their production unsold and are running on short time.

From observations taken during a recent trip through the Mohawk valley mill section, we think it is safe to say that the present production of the fleeced underwear mills is fully 3000 dozen per day short of the production at this time last season. Of course, however, we must not lose sight of the fact that the quantity of goods sold last season was phenomenally large in comparison with the business of former seasons and this very fact is, in a measure, responsible for the present stagnation of the market.

The manufacturers find themselves short of orders and threatened with the heavy loss which accompanies a shut down or reduced production; under these conditions offers have been accepted at the mill at figures lower than those quoted by their commission agents. The New York agents of an underwear manufacturer quoted as their rock bottom price on a line of men's fancy fleece underwear $3.95 net November 1st, but when the buyer visited the mill, he had no difficulty in placing the order direct with the manufacturers at $3.85 less 6% and interest to November 1st.

This is only one of several instances of a similar nature which have been brought to the attention of the writer during the present season, but they are expedients resorted to by manufacturers to keep the mill in operation. The cost of the raw material render a general quotation of lower prices entirely out of the question. It is hard to say what the outcome of the present state of affairs will be. With twelve-pound fleeces selling at $3.25 and all other grades correspondingly low, it is almost certain that bottom prices have been reached, but many large jobbers have not yet placed their orders, and, if they hold off much longer, it is hard to say how they can have their goods delivered on time, and, if business proves to be as good as it should be, according to the general prosperity of the country, some jobbers, who are holding off now, will in all probability, be scrambling for goods in August and September.

With fleeced goods selling at prices which ruled in 1899, and cotton about four cents higher, it is hard to see how the manufacturer is going to be able to deliver goods up to sample, and still figure a profit. This condition of affairs leads the average buyer to fear that considerable manipulation will be the result and trouble is generally looked for in deliveries.

In the better class of fleeces, designed more particularly for the exclusive gents' furnishing trade, one of the handsomest lines on the market is a silk fleeced mercerized faced garment in a fancy random stripe pattern made by a New York State manufacturer and sold at $13.50 net.

Business in summer weights is prov-

ing extremely satisfactory at second-hands and duplicates are coming in in very fair volume from all parts of the country.

The much talked of knit goods combination, has not yet taken definite shape but Messrs. Stern & Rushmore of New York, attorneys for New York capitalists who are interested in the scheme, are hard at work upon it and their representative has just returned from visiting the various mills throughout the State and reports very fair progress with prospects of early final arrangements. It is estimated that the combination, if effected, will be capitalized at upwards of $35,000,000.00.

Business on both fancy and domestic hosiery still continues good. Duplicates on spring and summer goods have been extremely satisfactory and fall lines are being freely bought. Many domestic manufacturers have been and are being equipped with machinery for making full fashioned goods, and five years ago it would have been thought almost an impossibility for an American mill to produce such goods as are being placed on the market this season by domestic manufacturers. Very rapid progress has been made in the hosiery manufacturing business of this country during the last few years and a great future is predicted for this particular branch of the textile industry in America.

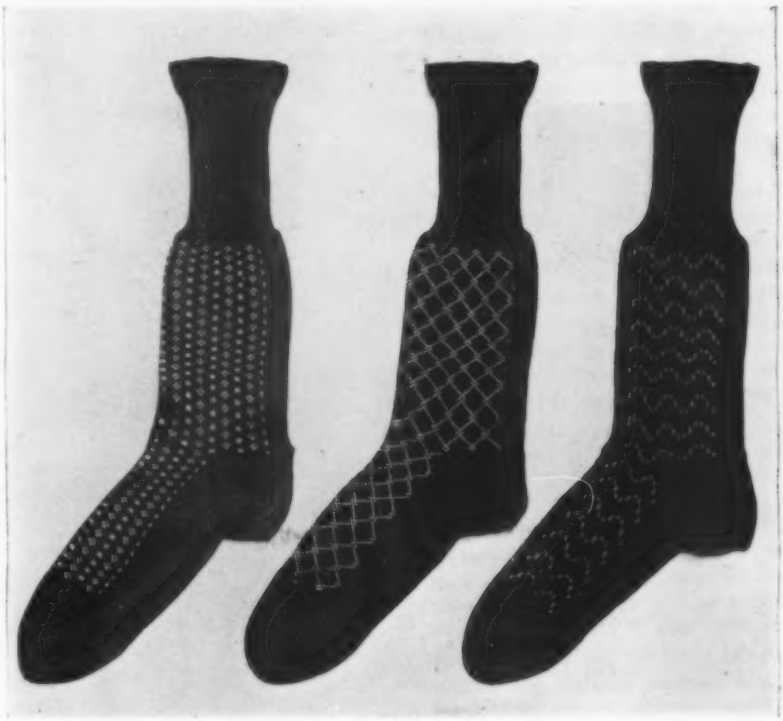


FIG. 3. FIG. 1. FIG. 4.

On the finer and higher priced jaquards, lace effects, and fancies, however, the foreign manufacturer still has the monopoly. In men's half-hose, many beautiful patterns are being shown. Figure 1 represents a line of excellent quality black lisle half-hose with dainty and genteel zigzag, and diamond patterns in white silk

thread. Fig. 3 shows a fine lisle hose, cadet blue ground with all-over square and cross pattern in white silk.

Figure 4 illustrates a hose made from a finer grade of lisle yarn in a combination of black and purple which is very effective. Such goods as these do not find their way to the bargain counter but are designed principally for the finer class of men's furnishing trade.

Reports from the Chemnitz market are to the effect that prices on staple goods are weaker and even on low-priced fancies, the demand is not as great as it was, some cancellations having been reported from American importers. But in the higher priced hosiery goods to retail at 75 cents and upward, the demand is brisk and many novel and beautiful designs and combinations are being shown.

Figure 5 represents one of the most attractive novelties of the season. This stocking is made from a very fine grade of lisle yarn, the top is black with cadet blue boot, the ankle and instep being covered with half-inch alternate stripes of white and black extending half way around the hose.

Another exquisitely handsome stocking which although it may appear somewhat loud is, nevertheless, a type of the popular styles of the season is represented in figure 6. This stocking is cardinal in color with zigzag pattern of delicate shades of pink, green, lavender and white extending down the front. Figure 8 illustrates a very handsome style in black and white combinations, the patterns being worked in white silk thread on a black lisle of the finest quality. In this connection we might mention that vertical stripes are much more in favor than the circular patterns of former seasons, which, however, are still to be seen in the cheaper grade of goods.

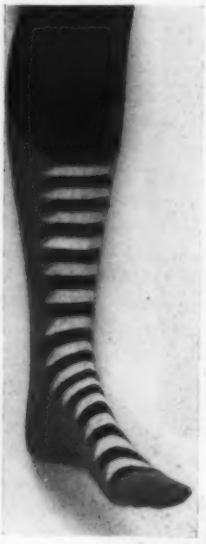


FIG. 5.

FIG. 6.

The glove trade for both spring and fall has been decidedly good. An excellent business has been done for spring and good import orders for fall have already been booked. One of the season's novelties for the spring season has been a Milanese lisle lace effect glove in beautiful dainty designs embroidered in silk. These have been sold only in solid colors, principally black, ivory, mode and tan with a smaller proportion of cardinals.

The principal feature of the glove

trade for fall is undoubtedly the golf glove which came into such great popularity during the last two seasons. This glove will be sold both in solid colors and fancies with plain reds and

FIG. 8.

whites in the lead. Domestic manufacturers are making some strong lines of golf gloves and the productions of the principal mills are already sold up for the season. This is partly due to the fact that it was almost impossible to get deliveries on this class of goods last season, the supply not being equal to the demand, consequently the jobber bought early this season hoping thereby, to gain prompt and early deliveries.

A Modern Knit Underwear Dyehouse.

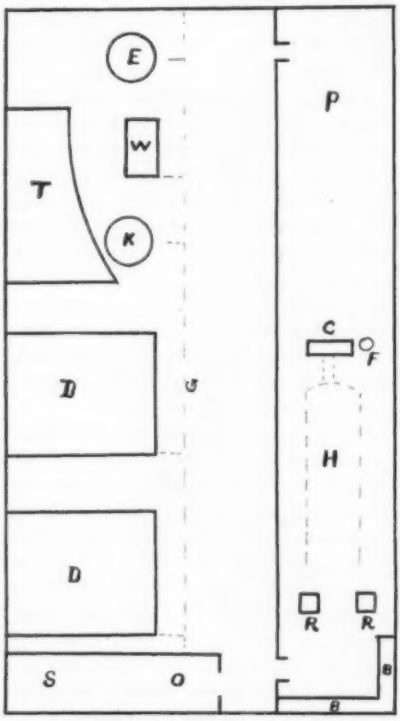
The plan and equipment of a dyehouse should correspond with the importance of the process of dyeing itself. There is probably no department in which more skilled judgment is required in the handling of goods than in the dyehouse; but, unfortunately, the dyehouse equipment in many mills falls far short of what it should be Care should be taken in arranging the rooms and machinery, so that the transfer of the goods from one operation to another can be effected easily and without an unnecessary amount of labor. It is an advantage to have the dyehouse located near to the boilers, as in this way much loss of steam by condensation is avoided.

A drain of ample size and good pitch should be provided, so that all waste may be quickly carried off. For handling 100 dozen men's ribbed underwear, a building about 60 feet long and 30 feet wide, and not less than 18 feet high, will afford ample room. It should be equipped with one cloth boiler, or kier, two dye kettles, one washing machine, one extractor and hot air drying chamber, and two cloth rolling machines.

The goods are first weighed and marked. They are then unwound from the roll, while supported on an iron rod, resting in a wooden roll stand. The cloth is then passed through the washing machine and sent to the kier, through a porcelain guide-eye, placed at the top of the kier, where it is received and placed evenly about the bottom of the kier by the operative. After boiling, the cloth is taken from the kier by passing through the porcelain eye, then

through the washing machine, after which it is delivered on a truck ready to be taken to the dye kettles. In this manner, cloth is handled at the minimum expenditure of time and labor.

After the dyeing operation, the goods are taken from the kettle and again rinsed by passing them through the washing machine, when they should be extracted. For drying some prefer to hang the goods over poles, where a good circulation of air



PLAN FOR KNIT GOODS DYE HOUSE.

can be secured, and then afterwards drawing the cloth on to sheet iron tubes about 15 feet long, through which a hot air blast is blown by a fan, the cloth being drawn from the tubes by a rolling machine. Others prefer to dry by the ho air blast. There are a number of types of drying apparatus designed especially for this purpose which have been described in these columns. Colored goods dried slowly at a temperature more lustre than those dried too quickly at a high temperature.

I would recommend the following dimensions for dye kettles, etc.: cloth boiling kier, round wooden tank, four feet in diameter, and four feet high; washing machine, rectangular wooden vat, six feet long, three feet wide, and three feet deep; this vat should be provided with a wringing machine; also a wooden roller, three feet long, and three feet in diameter, set across the width of the vat near the bottom. There should be two dye kettles, one of which is kept for light colors, and the other for dark shades. They should be rectangular in shape, six feet wide, seven feet long, and four feet deep. The interior should be provided with perforated board partitions, to divide the length of the kettle into six divisions, and at the same time allowing a free circulation of the liquor throughout all parts of the tub. The goods are moved by a six-sided reel placed over the kettle. Such a tub will handle at one dip, 25 dozen 12-pound goods, or in other words, six rolls of cloth, averaging about 50 pounds each.

A 40-inch hydro extractor will be found a convenient size, and will handle three rolls of cloth at one time. The floor of the dyehouse should be boarded tight, and incline a little from the sides to the centre. A four-inch iron pipe makes a good drain, and can be connected with the fittings to each tub or vat. The surface water will by this arrangement run to the centre and be carried off through suitable openings in the floor to the drain.

No dyehouse can be considered complete unless provided with a sufficient means of removing the steam, or vapor, from the room. This is a matter which frequently receives but slight attention, or is ignored altogether. I believe that fully one-half of the depreciation in dyehouse fittings may be attributed to the action of the steam, or vapor, in the atmosphere. Belts, shafting, pipes, pulleys and wood work, all suffer from this cause,

and yet there is very little excuse for this condition of affairs, because fans are now built, which are very efficient in removing steam from dyehouses. The accompanying plan shows the arrangement of machinery and tubs.

PALMETTO.

Washing and Scouring Knit Goods.

Before the wool can be spun and knit, it must be oiled or lubricated, and, while knitters are apt to regard the oiling as a secondary feature in the process, yet much depends upon the care with which it is carried out, and the quality of the oil used.

It should be remembered that whatever oil is applied to the stock must be removed before the goods can be bleached, dyed, or finished; there are, roughly speaking, two kinds of oils, those like olive, cotton, lard are saponifiable, and hence are easily scoured out by means of soda, and those which, like the mineral oils derived from petroleum and paraffin, are not saponifiable, and are with difficulty scoured out of the goods. In the saponifiable oils may be included oleic acid.

The mineral oils are very much cheaper than the saponifiable, and to those wool manufacturers who have an eye for cheapness there is a great temptation to use these oils, or mixtures of them, with the saponifiable oils. Oil merchants are constantly offering low grades of wool oils; now these contain very much mineral oil, and if freely used, no amount of scouring will remove it without killing the elasticity of the garment.

In order to keep the elasticity of a knitted garment as perfect as possible, says the Dyer and Calico Printer, it is essential to prevent any felting taking place. If there is anything that will tend to promote felting of knitted wool fabrics it is treatment in an alkaline or soap bath at a high temperature. If a good, easily saponifiable oil has been used in oiling the wool previous to spinning and knitting, then a light soaping with a good, neutral soap will answer very well, and the oil will be fully extracted, leaving the goods soft and elastic, and very little harm will be done; but in the case of a mineral a very vigorous treatment has to be given and much soap and alkali, either potash or soda, used, and then the elasticity and softness suffers, for the alkali always causes the production of a harsh feel on the wool, while the vigorous treatment tends to bring about felting, which impairs the elasticity. In the end, probably, the value of the goods is reduced by as much or more than the difference in the value of the oil used and of a good saponifiable oil.

To prevent felting, it is a good plan to treat the fabrics with a small percentage (1½ to 2) of chloride, but too much must not be used, or otherwise the goods will acquire an unpleasant yellow color and a harsh feel.

If the oil be not all extracted before the goods pass on to the dyer, it is very liable to cause spotted effects in dyeing; the shades come up uneven, with patches of dark and light spots, and the dyer is blamed for defects which he has not produced, and which are not due to any fault of his.

The quality of the soap used has also some influence. It should be good, pure, and neutral. If the condition of the goods demands the use of alkali, let the scourer add this himself. The soap should be well made, free from any unsaponified fat or grease, and any soaps containing the latter ought to be rejected, for these may get on the goods, and lead to stains in the after dyeing processes.

The degree of scouring should be made to depend upon the quality and condition of the goods. The object of the scouring is to remove all the grease, oil and dirt in the goods. The character of these will depend almost entirely upon the previous treatment of the wool. If the wool is in the first instance simply washed and then dyed in the form of loose wool, the knitted garments will contain the oil added before carding and spinning, and any dirt collected during those

operations and that of knitting; in general these are not difficult to remove if a good oil has been used. Sometimes the yarn is spun and then scoured and dyed before knitting, in which case but little scouring is required, particularly if during the knitting care be taken to see that little dirt collects on the goods. Then one need not fear any or much deterioration in the elasticity and softness of the goods.

If wool is taken in its raw condition, carded, spun, and knit, it will contain much grease and dirt, and require a good deal of scouring to cleanse it, but if care is taken in using a little potash along with the soap in the scouring liquor, but little deterioration in the elasticity of the goods need be feared.

Generally acids are used in the processes of dyeing, or if the newer direct dyes are employed, a Glauber's salt bath is used either with or without an acid, and as acids have no felting action on wool, little need be feared as to any loss of elasticity during the dyeing operations.

In all processes of treatment always allow plenty of liquor so that the goods can be kept well open and not compressed together. It is when squeezed up into as small a space as they will occupy that the risk of felting is greatest, and such a condition of things should be avoided.

Reference has been made to the property which chlorine possesses of preventing felting. This has been taken advantage of in the following manner: The goods are previously subjected to a scouring operation, for it is essential, in order to secure a uniform and successful result, that they should be free from grease or dirt. They are then well wetted out; next, they can be passed through a bath of hydrochloric acid of 5 deg. Twaddle strength, by which means they become more or less acidified; a liquor is made from chloride of lime (bleaching powder), allowing 2½ to 3½ lbs. for every hundredweight of goods to be treated. It is not advisable that the whole of this should be added to the bath all at once, but at intervals, as the goods are entered in and taken out of the bath. It is important that it should be clear and free from any undissolved particles of the bleaching powder.

Into this bath the goods are quickly entered, left in for two or three minutes, then taken out and well rinsed, when they are finished.

The action of the chlorine is very rapid, and so a long immersion in the chloride bath is not necessary, while it might be injurious in that it may give a yellow stain to the goods and make them harsh. Using the quantities given above, there is not much bleaching action exerted by the chlorine, so that even dyed goods may be treated.

Seamless Hosiery Fabric.

The illustrations Figs. 1, 2, and 3, show a method of knitting seamless hosiery for which a patent has recently been issued in this country.

The front and rear parts of the foot of the stocking are composed of independent threads which are interlooped or interknit at the sides of the foot, each course of stitches around the foot consisting of two short threads having their ends terminating on the inside of the stocking.

In the view of a seamless stocking at Fig. 1, the dark and light shades show the parts of the stocking made by the different yarns.

Fig. 2 is an enlarged view of five courses at the point of the interlocking of the threads at one side, and Fig. 3 shows the manner in which the two threads are laid in a single course around the foot.

These stockings are knit on circular machines, the threads being each introduced as a continuous thread as shown in Fig. 3. The thread b, which we will assume to be the thread forming the rear part of the foot, is fed to the needles in the usual manner a little more than half-way around the needle-cylinder, when it is

drawn inward and is no longer knitted into the fabric.

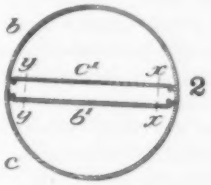
At a point in advance of the place where the thread b is withdrawn, the thread c is brought into position to be taken by the needles, and the two threads for a short space are both knitted into the web or stocking.

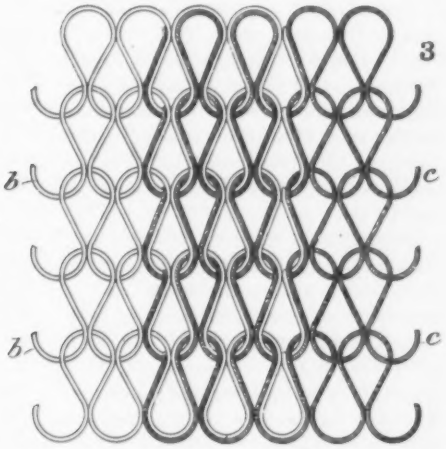
At the opposite side of the cylinder the thread c is again carried a little more than half-way around the cylinder, and the thread b is brought into action slightly in advance of the withdrawal of the thread c; so that the two threads are knitted together into the web at that side, after which the thread c is withdrawn.

After the foot of the stocking is completed the threads will be found floated across the interior of the foot, as indicated at b′ and c′. These float-threads are then severed on the dotted lines and the stocking finished for the market in the usual manner.

The foot will then be found to be composed of short threads, each extending a little more than half-way around the foot and knitted together or interlocked at each side of the stocking. This interlocking of the threads is found to securely fasten the threads, and the web is found to be as strong and durable as when the foot is composed of two continuous threads interlooped at each side.

The two threads may be knit by one, two, three, or more needles, as may be found most desirable. In Fig. 3 the threads are shown as passing together and being jointly acted upon by two needles, while in Fig. 2 the two threads are shown as they would appear when interknit or interlocked by three needles. In this figure, b designates the thread for the rear part of the foot, and c the thread for the front of the same, and this figure, taken with the diagram shown in Fig. 3, clearly shows the interlocking of the threads and the mode by which it is accomplished.





The inventor claims that one of the advantages of this mode of making stockings is the greater speed at which the machine can be run while knitting the foot, as compared with the mode of making feet of different colors by reciprocating the movable parts and interlooping the threads.

Sizes of Hosiery.

In an article which appeared in the January issue of the Textile World under the heading of "Standard Sizes of Knit Underwear and Hosiery," the statement that the "standard length of leg of ladies' hose is 27 inches" is quite correct and this standard is almost uniformly accepted, both by the domestic and foreign manufacturers and buyers. Of course, this rule is not, and cannot be, strictly enforced, and it is rarely that a buyer will make complaint if the smaller sizes, say 8 and 8½ should measure 26¾ or even but 26½ inches in length but shorter than this would be considered an objection and the buyer would be perfectly justified in refusing to accept the goods.

On the other hand, if the sizes 8 and 8½ are shorter than 27 inches the buyer has a perfect right to expect that the sizes above 9, that is sizes 9½ and 10 should be proportionally longer than 27 inches. It is generally accepted that the average of 27 inches on size 9 is the standard length for ladies' hose.

Throughout all lines of hosiery—men's, women's, children's and infants'—there is this same deplorable lack of any uniform standard for the guidance of the manufacturer, and until in some way or other some fixed standard is established and rigidly enforced, controversies on this subject will be a matter of constant occurrence. In ladies' hose and men's half hose, there is one measurement, however, which is definite, and that is the size of the foot, on which is based the size of the stocking in general. The foot must measure in inches precisely the same as the size which it is supposed to be, that is, a size 9½ stocking must positively measure 9½ inches from curve of heel to tip of toe. But in children's hose, more particularly in the cheaper grades of domestic ribbed hose, we regret to say that much variation occurs in respect to the size of foot. Many lines of children's hose are made or supposed to be made to the following scale of sizes: 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, and they are duly stamped accordingly, but, in reality, we think we are quite safe in saying that many manufacturers will make only five actual sizes, that is, 5, 6, 7, 8 and 9, the intermediate half-size being boarded to appear as though knit to the required size.

The old rule of "three times the length of the foot should equal the length of the leg" has no bearing whatever on ladies' hose, and is not even correct, when applied to children's hose, although this is where it is intended to apply; a more correct rule, however, and one which is more generally quoted and accepted as correct, is "two and three-quarters times the length of the foot should equal the length of the leg." It is very readily seen that the rule, "three times the length of the foot should equal the length of the leg would be absolutely out of the question to apply to ladies' hose when it is considered that according to this rule a nine and a half stocking would measure twenty-eight and a half inches in length and a ten inch stocking thirty inches in length, which would be almost an opera length.

The custom of knitting sizes into the hose in the shape of what is called the "size mark" which is done by dropping a stitch for each size is an admirable one in every respect and one which should be adopted as generally in this country as it is abroad. In half hose this mark is usually placed directly below the ribbed top and in ladies' hose just below the selvage. This would render impossible the practice which is all too frequently resorted to among jobbers of "marking up the size" as it is called when the stock becomes broken; when some of the sizes, usually the larger ones, are missing, the smaller sizes are marked up to the required size with a stencil and marking fluid. We venture to say that there are not a dozen jobbers in the whole country who are not equipped with a marking outfit of this description and who do not at times resort to the use of it.

SYSTEM.

SILK DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Leading European Silk Fabrics for Spring.

LUDWIG BRAUN.

A class of goods likely to be popular for next spring is taffet boyan raye. Boyan is an effect of weft, which appears in certain places, on the right side of the fabric. A good fabric in this line can be manufactured as follows: Warp, 195 threads to the inch, good quality Milan organzin 20/22 deniers; taffetas will not stand a fine reed; use a 65 reed, 3s; Japanese silk is inadmissible, being too rough.

The weight of the warp should not exceed par, because the size of the organzin is fairly fine, and taffetas require a short material in order to ensure a quick weaving. The principal thing in the manufacture of these boyan taffetas, is the correct preparation of the weft. As raw material for the weft, it is best to make use of Japan tram filature, if possible 3-fold thrown, in a size of 30/34 deniers, weighted 30 to 40 per cent. over par. It is well known that Japan tram gives the best handling of all raw silks, because the thread of this material takes the dye best. In finer sizes of silk, say from 26 to 28 deniers only 2-fold trams are used. If the above-mentioned weight is exceeded, the silk loses in brilliance and general appearance, and does not weave so well; 105 to 110 picks per inch are enough, but 2-fold filled.

The spools in the shuttle must retain a strong tension, in order to produce a smooth surface. For the warp, light colors alone are to be employed, such as rose-pink, turquoise, sky-blue, fraise, heliotrope, grey and bluette. the weft is always white; it goes without saying therefore that the warp colors must not be too dark on account of the white color of the weft. If we take too dark a color in the warp, the color of the weft will shine through and the fabric will be unsalable.

This boyan is manufactured not only in simple stripes, but also in jacquard designs. In the latter case, the warp can also be white. As to the figures, geometrical designs are now in vogue, especially different sizes of balls to form the boyan stripe; but take 5 or 6 threads of cotton; about 80/2, twisted fairly tight ("usual").

Another article, which has good prospects, is called Taffetas Chameleon. This is a plain fabric. Its manufacture offers considerable difficulties. The name is derived from the well known animal, the coloring of which is very different according to its state of mind, the temperature and light; it can change from green to violet, straw-yellow to dark-blue and black. An attempt has been made to imitate these sparkling effects in the weaving. The warp has about 225 threads to the inch, Milan organzin 19/21 deniers, weighted 5 per cent. over par. The weft is of two colors, which must be shot in with the same pick, not one after another. For this purpose we employ a shuttle with two spools of yarn of different colors. Good color combinations are; for the warp, a light grey, and for the weft, light gold and cardinal. In this cloth a

watchful eye must be kept over the strong tension of the weft threads, in order that they may come tightly into the fabric. Weave with 120 to 125 picks to the inch, of 28/30 deniers Japan tram, 3-fold thrown, one spool light gold, the other cardinal.

The same fabric is also manufactured in combination with satin and cannele stripes, the taffetas ground being generally white, the stripes colored, for instance: rose, heliotrope, cardinal and also black.

Various designs can be made by using different widths of stripes, for example; begin on the left side of the fabric with a small stripe of satin, growing broader to the middle, this latter being the broadest part and decreasing on the right side. It happens frequently that, especially in the small designs, the satin stripes get out of their place. In order to prevent this inconvenience, we must put two or three threads of taffetas into the first reed of satin on each side of the stripe. This being done accurately, the threads will not lose their direction.

Sometimes pieces coming from the looms are crumpled. In such a case these pieces should not be given to the finisher, in order to get them smooth. In general, silk fabrics should not be finished, because by finishing they lose a great deal of their brilliance and soft handling. It is customary to fold up pieces as soon as they come from the loom. The above mentioned fabrics should be kept on the weaver's or other beams for a week or, if they are in bad condition, for a fortnight, and between stiff paper, which is rolled up during the weaving.

For in a piece once folded up, it is almost impossible to remove the crease marks. This has the disadvantage of preventing the piece being perched, which is, however, the lesser of the two evils.

As substitute for taffeta there is another cloth in the market, called Louisine. It consists of very small squares and bears some resemblance to the Patte and Panama bindings. In comparison with taffetas it requires a greater density of the warp and rather more material of weft. A good middling quality must have for instance 280 warp threads to the inch, put into a 70s reed, 4s. As organzin can be used for warp, either Milan and Japan organzin in a size of 20/22 deniers, weighted 10 per cent. over par will answer, Japan trams in a size 24/28 deniers weighted 60 per cent. over par, but shot in three-fold, can also be used. Weave with 100 to the inch.

The first essential for a good cloth of Louisine, is a very even and regular wefting, that is to say four or five picks per inch more or less than the requisite number, will make a great difference in the effect produced.

Alpaca is the name of a cloth in great vogue at present, especially for millinery trimmings and waists for ladies. The warp consists of glazed yarn, the weft is silk. A good type is made as follows: Warp 60 threads to the inch, no 50 2 fold; filling, two-fold China tram, 28 to 30 deniers shot in 2-fold, using a middling quality of raw material, well known in the market under the name of "Min-chu," with 275 picks to the inch.

This article is made up in plain goods, fancy checked and striped goods (jacquard); there are also qualities with satin stripes. Alpaca is used for broad silks 18 inches wide, and also for ribbons. It is considered peculiarly adapted for summer wear, being light and durable, and is therefore likely to meet with a widespread demand.

Another fabric for next summer is wash-silk, the warp of which also consists of cotton not glazed. In view of the importance of this material, we will give an exact description of a quality costing in 32 inches about 40 cents per yard: Warp 86 threads to the inch, No. 120, 2-fold, fast twisted (usual); 43 reed 2s. In the dyeing, care must be taken to preserve the soft handling of the yarn, in order to

assure a good working, and later on in the garment a smooth feeling. The weft consists of China grege in a very coarse size, 40 to 45 deniers, shot in single, consequently the article must be piece dyed, as it is impossible to dye grege in hanks.

We will give a type for fancy designs, in the gauze genre. The ground is interrupted every 1⅝ inches by a small gauze stripe ⅜ inch wide. The warp threads in these places are also of silk. The cotton is dyed pink and the silk is white, consequently the gauze stripes will be also white. As regards the number of picks, it should not exceed 90 to the inch. There is also a class of designs in which the ground is ornamented between the gauze stripes with little geometrical figures, points, balls, etc. These latter are of course also white, because they are taken from the weft.

In conclusion we may mention one of the last novelties, called Damasse chine, the warp is printed before weaving, and in consequence, must be cleaned of all impurity before weaving; the ground may be taffet, satin de chine, or merveilleux. A medium quality in this cloth is manufactured as follows: We take a 600s jacquard machine and a warp of 240 threads per inch, put into a 60s reed 4s; if we weave taffet in the ground we must employ a very fast thrown material, which has not less than 42 turns to the French inch, and it is best to take a good quality from Milan in the size of 22-24 deniers, weighted not over par. As to the weft when satin de chine and merveilleux ground is woven, we can diminish a little the quality of the raw material in the weft. We can use for instance a Canton tram in a size of 32-36 deniers shot in 2-fold with 150 picks to the inch. It must be born in mind that only in the case of Satin de Chine or merveilleux ground being woven, can this Canton tram be used. When we have taffet to manufacture only a good quality of Japan tram can be employed.

There is also a demand for fabrics with gold effects, especially on soft grounds like satin and merveilleux, also taffet. We do not think that these goods will be popular to any large extent, because it is impossible to get the gold threads at a cost that will permit of a reasonable price for the goods. Goods of this nature enjoy only a short lived popularity.

Improved Method of Weaving on Needle Looms.

The accompanying diagrams illustrate an invention recently patented which has for its object to improve the construction of tissues produced upon needle-looms.

By "needle-looms" is meant looms which employ a needle or needles to carry the filler back and forth through the shed and which employ needles at the edges of the fabric to hold the loops of the filler-threads until the filler-threads are bound in by the warp.

The inventor states that in needle-looms as now constructed no adequate means are provided to draw these loops into the edge of the fabric, and consequently the edges of the fabric are marred by these minute projecting loops. that by this device he is enabled to avoid the loops. This is done by providing at the edges of the fabric an additional set of warp-threads, with which the filler-threads are bound; these warp-threads are held at sufficient tension to draw the loops firmly to the body of the fabric when they are released by the forming needles.

Figure 1 is a view showing the course of the threads. The loops at the edges are left projecting in order to clearly show the course of the threads. In practice these loops are drawn into the edge, as will be explained. Figs. 2, 3, 4 and 5 show the course taken by the threads at the various picks.

In the figures I have shown a fabric having its edge made by a double

weave, with an additional or "pulling-in" weave between the double weave. The warp-threads of the top weave of the edges are indicated by the reference letters a, and the warp-threads of the bottom weave by the reference letters b, the weft-threads of the right-hand needle are indicated by the letters c, the weft-threads of the left-hand needle by the letters g, and the additional or pulling-in warps are indicated by the letter f. The first pick comes from the right (the double-thread c, Fig. 2), is woven in with the

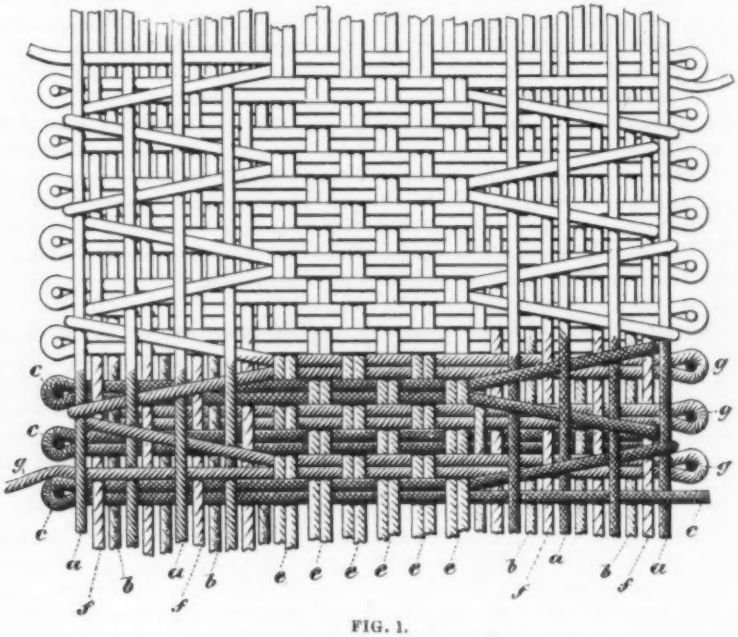


FIG. 1.

weft-threads a of the top weave on the right side or edge, is woven in with the body or ground of the fabric, warp-threads e, and is then woven in with the warps of the middle or pulling-in weave of the edge at the left side, the threads f, leaving a loop at the left side of the fabric on the needle d, which loop is pulled in by the warps of the middle or pulling-in weave when the needle releases the loop-weft, so that the aspect of the edge is not marred by a projecting loop. The second pick comes from the left (the doubled thread g), is woven in the upper edge weave at the left edge of the fabric, is woven in with the ground weave in the body of the fabric, and is woven in with the middle weave at the right edge of the fabric, the loop when released by the edge-forming needle being drawn in by the warps f of the said weave. These various operations are illustrated in Fig. 2. The third and fourth picks are shown in Fig. 3, in which the third pick is woven in with the bottom weave on the right side of the fabric, the ground or body, and the middle weave on the left side of the fabric. At the fourth pick the thread g is woven in with the bottom weave on the left-hand side of the fabric, with the ground or body weave and with the middle weave on the right-hand edge of the fabric. In Fig. 4 at the fifth pick, the doubled thread c, coming from the right, is woven into the top weave at the right-hand edge, the body weave and the middle weave at the left-hand edge, and at the sixth pick the doubled thread g, coming from the left-hand side, is woven in with the top weave at the left-hand

edge of the fabric, the ground or body weave and the middle weave at the right-hand edge of the fabric, the fifth and sixth picks being similar to the first and second. In Fig. 5 is shown the seventh and eighth picks, which are similar to the third and fourth, respectively. In this manner each weft or filler thread is woven in with the respective edges, the loop ends of the filler-threads being woven in with the middle weaves of the said edges, by means of which the loops are drawn in to the edge.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

—Every man has three characters: that which he is; that which he pretends to be; and, that which he believes himself to be.—Karr.

Abuses in the Weighting of Silk Goods.

The damage resulting from the excessive weighting of silk fabrics has recently become the cause of numerous disputes between manufacturers, dyers and dealers in Europe, says the Bulletin des Soies et des Soieries. For a long time there has been a growing discontent among the consumers of silk goods, regarding the inferiority of fabrics sold to them, but complaints from the feminine consumers avail nothing, in the face of the necessity of producing cheap goods, which was forced upon the manufacturers by the consumers themselves. Besides, the fashions have been so fickle that the patterns went out of style before even

the inferior fabrics were worn out.

Under such circumstances, the manufacturers argued that it was out of the question to use durable and expensive material for styles which lasted but one season. The law of cheapness was the supreme law of the industry, and the silks which were not loaded, were so expensive as to be unsalable. This was the line of reasoning which prevailed, but it has happened that as the art of treating, or loading, goods in the dyeing process, advanced, the durability of the goods was reduced so much that the goods changed while still in the possession of the retailers, or even while still in possession of the manufacturers themselves; hence arose the disputes between the buyers and manufacturers, and dyers, in which each one sought to lay the blame for the trouble upon the shoulders of the other.

Two years ago, the abuse of this weighting process was so great that the Swiss dyers at Zurich entered into an agreement to reform the abuse of which they had become the victims. In spite of this, the evil continued, and today it is customary for the following clause to be inserted in the order sheets: "Goods can be returned if they get weak or rotten in a couple of months," and the buyers stipulate that a sufficient sum shall be withheld in order to guarantee the carrying out of this clause.

The buyers themselves have been in a great measure to blame for the growth of this evil. It has been due in great measure to their strenuous demand for cheap goods, and they have at last been caught in their own trap, and have quickly found the best remedy for the abuse. The manufacturers and buyers who are held responsible for the durability of the goods will soon reduce the quantity of weighting materials. Holding them thus responsible will provide the remedy which never would follow the complaints made by the retailers and consumers.

Accompanying this reform, may be noticed an increased popularity for brilliant taffetas, metalline, etc. These effects can only be produced when the goods are either made of pure silk, or at least but moderately weighted. It is but the resurrection of styles produced some forty years ago, and before Fashion put the seal of approval upon the dull, dead finish which is produced by weighting the goods heavily. It is to be hoped that this change will be durable, and that the popularity of the brilliant effects in silk goods will continue for a long time.

—The U. S. Consul at Reichenberg reports that there are factories for the production of artificial silk in active operation at Besancon, France, Wolston, England, and Spreitenbach, Ger. He states that it is reported there are others in Belgium and Germany, but expresses doubt as to the success of the industry. He says that the reports concerning this industry should be taken with a grain of salt. On the other hand, the U. S. Consul at Frankfort says that Dr. Freund, in a recent lecture in that city, stated that artificial silk bears the same relation to natural silk that oleomargarine does to butter. It can compete with natural silk, but is not as valuable. It has been used for covering for cables and a substitute for horse hair, but has a tendency to break when wet, and for this reason is usually mixed with natural silk and cotton. The lecturer stated that more brilliant silk can be produced with artificial than with natural silk, that it is cheaper and that the outlook for the industry is very promising.

—Cotton manufacturing in Mexico is at present in a very unsatisfactory condition. For several years the industry has been very prosperous there; the business has been overdone, however, and today falling prices, large stocks of unsold goods and slack or idle mills tell the story of overproduction.

POWER DEPARTMENT.

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ELECTRICITY—STEAM—WATER.

Water Power.

Abstract of a Lecture Delivered by Arthur T. Safford at the Lowell Textile School.

New England becomes inevitably a manufacturing centre on account of its natural advantages. The high mountains serving to catch the rain and snow, the deep valleys which retain the snow in the early summer to melt and keep up the flow, the lakes and ponds serving as great storage reservoirs, all combine to make the great New England rivers among the most constant in flow in this country. Of course, there is a great difference among them; but, there are not such great differences between freshet and drought as we find in the rivers of the west and southwest. In New England, the freshet flows are often times 50 times the flow in drought; in the west and southwest, perhaps 250 times.

As the value of a water power depends to a great extent upon its dry weather flow, it can readily be seen that, all other things being equal, the stream which varies least in flow is the most valuable for water power purposes. The most perfect water power would be furnished by a stream coming from a large lake or chain of lakes, where the flow could be regulated every day according to the uses to which the power was put. Such a power is rarely found, excepting in very small ones. I know of no power more permanent than the Pesumpscott River, which flows into the ocean about four miles north of Portland, Me. It is only twenty-two miles long, has a watershed of 700 square miles (about one-sixth of the Merrimack above Lowell) of which Sebago Lake (50 square miles in area) has ⅔ of the entire watershed. The lake can be drawn down during the summer to a point where melting snow and rain in the spring will fill it up again.

It the ten years' period previous to 1896, the greatest flow was 1670 cubic feet per second, the lowest 400 and the average 820. The greatest flow, therefore, is but four times the least as against 60 times in the case of the Merrimack.

We have almost as favorable conditions of flow in the Winnipiseogee river, which forms a part of the Merrimack system. Flowing out of Lake Winnipiseogee with an area of 71¾ square miles and fed by a watershed of 366 square miles, at the outlet of the lake the flow can be regulated so that it is an almost constant quantity each day in the year. This flow from the lake we depend upon here at Lowell during the months when the quantity coming in from other sources has fallen off. Taking a large river like the Merrimack, as a whole, it is found that the area of lakes, etc., is but a small portion of the whole, so that there is not the opportunity to store much water, as is the case on the watershed of the Winnipiseogee river.

It was known very early in the history of water power that next to a large watershed, contributing to a stream, a large mill pond was an important factor in insuring a permanent flow in the canals. The mill pond above Lowell is about 16 miles long. The depth of water from the stone dam up to the ordinary height, when the mills are not running, is about four feet. This

storage is held back by what are called flash boards, which, held by the pressure of the water against iron pins in the top of the stone dam, serve as a temporary dam to hold the water back during the night and dry seasons of the year. They serve two distinct and important purposes, one to keep the general level of the river above the head gates, up to a certain height, and the other to store some or the whole of the water which would run to waste at night. The amount of storage in the mill pond serves to keep the canals up until the water gets along from up river.

ing high water, particularly when the ice is running, we expect these boards to be bent over or carried away. This sometimes has a serious effect upon the head in the canals, because it is not possible to foresee the time of their breaking down, or repair them until the water has gone down. While generally a rise in the river is followed by plenty of water and a good head in the canals, this may be overdone, and we are in the condition of the good deacon who prayed for rain and got a cloudburst which drowned out everything in sight. We do not like too heroic measures in water and

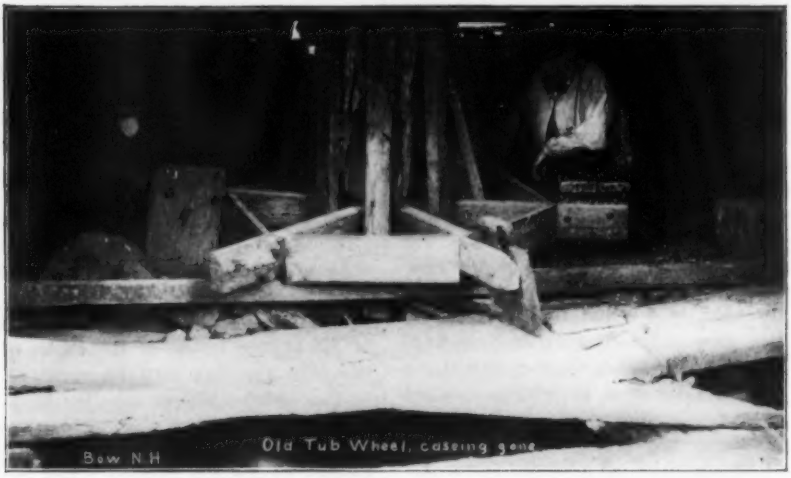


FIG. 1.

The mills at Lawrence, eight miles below us, have to depend in the same way upon their pond to keep them going until the water gets along from Lowell. The flashboards and water stored behind them serve as the regulators of the flow, and make it possible to draw in 10½ hours in most seasons of the year what comes during the 24 hours. It is proposed to still further increase this storage of water by means of additional flashboards.

The flashboards, like everything else, have their weak points. From the definition of flashboards, they are supposed to be permanent; and, dur-

power matters, but we cannot always have just the proper quantity of rain.

During the winter months it is extremely difficult to keep the canals free from ice and snow. The amount of trouble varies a good deal with the season. If the cold weather comes on with the river high and open, the running water forms what is called anchor ice. This is drawn into the canals by the draught from the mills, and has to be taken care of through the waste dams. It is heavy, sometimes nearly submerged, and if drawn on to the racks nearly impossible to get off. Snow and ice together are also very troublesome with the river

open, and need constant attention; generally, however, the river freezes over with the first cold weather, increasing in thickness until it is so strong that it does not break up when the gates are open in the morning. There remains then what freezes in the canals over night, and which breaks up, most of it, as soon as the mills start in the morning. Men are stationed at all the waste dams, who break up the ice as it comes in sheets towards the dam. The ice varies in thickness from a half-inch to sometimes 2½ inches, when the freeze has been from Saturday noon until Monday morning in very cold weather. When it is considered that almost every morning in winter we have ice from an area of canals 1,300,000 square feet in area to get rid of, it may suggest itself to you that an occasional falling off of the speed cannot be laid up against the company having the water power in charge.

Of the total of 33,000 horse power used by the mills at Lowell for motive power purposes, probably 15,000 horse power, or nearly one-half, is furnished most of the year by the water power, while for a part of the time it is considerably more.

The mills at Lowell draw from the nearest canal a certain number of mill powers, the name coming from the power required to drive a complete mill built at Waltham, about 1824, containing "3584 spindles, spinning No. 14 yarn, with all the apparatus necessary to convert cotton into cloth." I have quoted this last from an interesting paper by Nathan Appleton, who was one of the pioneers in cotton manufacturing, on the "Introduction of the Power Loom." A mill power was found to be something over 60 H. P. At the point where the water is taken the responsibility of each mill begins, and continues until the water drawn is discharged back into another canal or the river.

The choice of the kind of waterwheel used, and the method of transmitting the power, rest with the mill corporation, no other rules except the manner of measuring the water and preventing leakage being laid down by the company managing the water power. For this reason perhaps there is a great variety in the waterwheel plants of the different mills, as with all the other machinery. The different kinds may be an interesting question to take up briefly. It is possible, from material at hand, to trace clearly the development during the last 75 years, in the manner of building waterwheels, the improvements made, and greater efficiency resulting from these improvements.

Most of the water used previous to 1850 was with breast wheels, so-called. In principle, they were more like the paddle wheels of our river steamboats, than anything else, with one addition; there was a breasting or apron from about half way up on the circumference of the wheel, where the water was let into the buckets, down to a point well below the bottom of the wheel where the water discharged. This almost touched the circumference of the wheel as it revolved, and served to keep the water from spilling out of the buckets. Some of these breast wheels, principally in England, were made of iron, and as large as 30 feet in diameter. Their efficiency was comparatively high (60% when well built), but were not economical when the water was so low that it would not fill the buckets.

It is very easy to see the location of these old breast wheels in many of the present wheel pits. The wheels were sometimes 16 feet long, and from 12 to 17 feet in diameter; the ends of the shaft resting on heavy stone piers, which would perhaps be the only supports. Most of them had a rack, or spur gear, around the circumference of the wheel at one end, which drove into a pinion on the main shaft.

The best example of breast wheels in Lowell could be seen as late as 1896, at the Concord River Mill of the Middlesex Company. There were three wheels, aggregating 48 feet

long, and 12 feet in diameter. The arrangements of gate, etc., for admitting the water to the wheel and transmitting the power, were about the same as the Lowell Machine Shop wheel. They were all clumsy, and required a great deal of room, both in area and in height, for the power they gave, but served the purpose well until the mills put in modern wheel plants, and 6-30 in. Turbine

FIG. 2.

wheels took the place of the 3-16 ft. breast wheels, giving probably 50 per cent. more power.

There were one or two examples of the tub or scroll wheel here in Lowell, but they are in a measure transitions from the old breast wheels to the Boyden wheel, and did not come into general use in Lowell. The first Boyden wheel, named from its inventor, Uriah Boyden, was designed and built for the picking department of the Appleton Company, in 1844, and its increased efficiency soon made this type universally used. The greatest difference between the Boyden wheels and the old breast wheels, is that in the Boyden wheel the water in admitted through the guides to all parts of the wheel at once, instead of simply at one point in the circumference. The discharge is from the guides which are inside of the buckets, out through the wheel into tail water.

A whole evening might be devoted to the description of this wheel; but I will only say that at full gate this wheel gives an efficiency nearly as high as the most modern turbines, and its wearing qualities have been remarkable. There are some today in Lowell, parts of which are 50 years old.

A 42 inch Swain wheel, built and tested in 1869 and again in 1870, gave a somewhat better efficiency at full gate than the Boyden wheel had given, and at part gate showed a decided gain. This wheel differed from the Boyden in having an inward discharge from the guides into the wheel the water leaving the wheel near the shaft. The gate of this wheel, unlike any others, opens downwards, admitting the water at part gate always near the top of the wheel. The model alluded to is of an old-fashioned pattern, and hardly like the wheels at present built by this company.

The improvements in the Swain wheel and others of a somewhat smaller kind, bring us down to the present time. We have in Lowell today, if my memory is correct, 80 large wheels, of which 27 are Boyden wheels, and the others of a more modern type. Most of these are on vertical shafts in single wheel pits, the power being transmited through crown and bevel gears on to a main or jack shaft.

A recent demand for high speed water wheels to drive dynamos for the purpose of developing electricity, or to grind pulp in the great pulp

mills has led to the installing of wheels singly or in pairs on a horizontal shaft. These wheels are placed in a steel case or flume at a level well below the canal, but above the height of the lower canal or river, the discharge from the wheels being through tubes called draught tubes. The wheels drive a pulley or pulleys on the same shaft from which power is belted off. In a great many ways this method of placing the wheels is a decided gain. The wheels and case are above the water, which brings them out of wet and grimy wheel pits, where they can be kept in good repair and probably have a longer life than they otherwise would. There are no gears to break, which reduces the noise and cost of transmission. With proper designing, they can be as efficient as the vertical wheels, and from their convenience will probably replace the older vertical wheels as they wear out.

In this brief outline, I have tried, at least, to touch upon the main points, and give you some idea of where the power comes from, what some of the difficulties are in the way of supplying it to the mills in large quantities, and how it is used inside the mills for driving their machinery.

The illustrations will show the reader some of the wheels used in the early development of water power, in contrast with the more modern type. Fig. 1 is an old type of wheel, with the case gone, which was used at Bow, N. H. Fig. 2 shows a pair of Rose wheels, used at Brown's sawmill at Bow, N. H. Fig. 3 represents a Lawrence section wheel room, showing wheel, case, and draught tubes.

Ventilation and Heating.

The particular features of this combined system of ventilation and heating in which a fan is employed to distribute the heated air are thus summarized in a recent lecture by Walter B. Snow of the engineering staff of the B. F. Sturtevant Co., Boston, Mass:—

The entire heating surface is centrally located, enclosed in a fire-proof casing, and placed under the control of a single individual, thereby avoiding the possibility of damage by leakage or freezing incident to a scattered system of steam piping and radiators.

The heater itself is adapted for the use of either live or exhaust steam, and provision is made for utilizing the exhaust of the fan engine, thereby re-

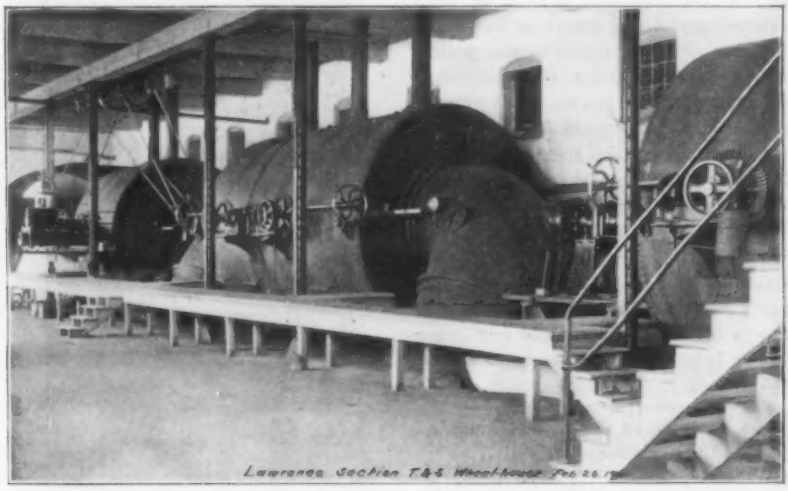


FIG. 3.

ducing the cost of operation to practically nothing. At all times ample and positive ventilation may be provided with air tempered to the desired degree.

Absolute control may be had over the quality and quantity of air supplied. It may be filtered and cleansed, heated or cooled, dried or moistened at will. By means of the hot and cold system, the temperature of the air admitted to any given apartment may be instantly and radically changed without the employment of supplementary heating surface.

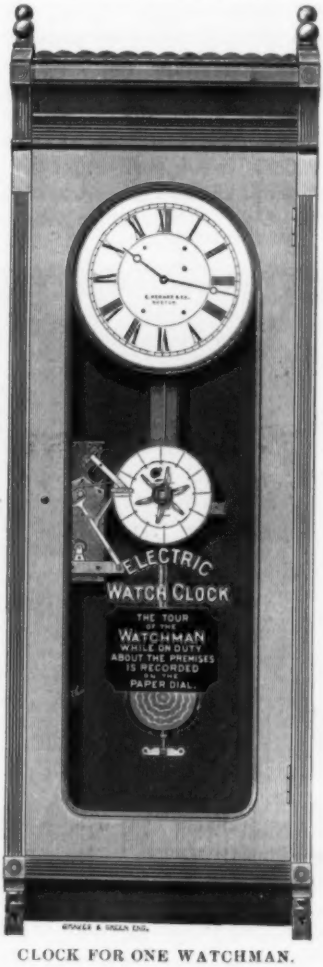
The pressure created within the building is sufficient to cause all leakage to be outward, preventing cold inward drafts and avoiding the possibility of drawing air from any polluting source within the building itself. By returning the air, using live steam in the heater and operating the fan at maximum speed, a building may be heated up with great rapidity, as is usually desirable in the morning.

The area of heating surface is only one-third to one-fifth that required with direct radiation while the primary cost and operating expenses of a fan is far less than that of any other device for moving the same amount of air.

The E. Howard & Co. Watchman's Clocks.

It has been the policy of the Howard Clock Company, to make nothing but first-class goods, and, as a consequence of the pursuance of this policy during a long term of years, their name is a sufficient guarantee for the merit of any timepiece coming from their works. They have been manufacturing watchmen's clocks for 45 years; for over 25 years their watchmen's clocks have been exclusively electrical. They have constantly endeavored to perfect their watchmen's clocks, and the clock manufactured by them today is offered to the public with every confidence on their part that it is equal to the best.

The clock by which a watchman's record is made, can be arranged for any number of watchmen. Fig. 1 shows a clock for one, and Fig. 2 one for 12 watchmen. Any number of stations can be added to or taken from the set of stations, without interfering with the working of those remaining. The manufacturers claim



CLOCK FOR ONE WATCHMAN.

that anyone may have free access to the interior of the clock without being able to prevent an accurate record of the watchmen's movements being made.

Notwithstanding the cases are made in the most thorough manner possible, the doors are set in a rabbet and locked with a Yale lock. When desired, a recorder can be attached.

which prevents the door being opened without making a record on the dial. The record made is permanent, as it is made by punctures through the dial. These can be filed for reference, and, as every manufacturer knows, are of great importance in the adjustment of insurance rates.

The clock may be placed in the office or any building, near to or remote from the watchman's duties. Two wires only running from the clock throughout the building, are necessary for any number of points which the watchman visits. A station is placed at every point which it is desired the watchman should visit, and a record is made by the insertion of a key (which fits all stations alike), and giving one full turn. This effects the necessary connection with the clock, and the record of the watchman's visit is recorded by which the time as well as the station is recorded on the dial.

CLOCK FOR SIX WATCHMEN.

It is not necessary that a box or station be visited in any particular order or time, for the record of each box is given independently of any other.

The E. Howard Watch & Clock Company state that they have been careful to avoid all attachments and devices in connection with their watchman's clock which would in any way complicate the mechanism. The idea has been kept steadily in mind to make an apparatus simple and effective, in accomplishing the sole object of determining the time at which the watchman visits each station in the mill.

It is claimed that the expense of keeping this system in repair is very small, and for further information we refer our readers to the manufacturers, E. Howard Watch & Clock Company, Marlboro Bldg., Washington Street, Boston, and 41 Maiden Lane, New York. They refer interested parties to the large number of concerns now using this watchman's clock.

—Reason is separated from folly but by a spider's web.—Reroy.

—If all should die who did not obtain what they desired, who would be left on the earth?—Pythagoras.

—When I enter a country, I am concerned not so much as to what the laws are, as to whether they are enforced or not.—Montesquieu.

—Conscience speaks, but self interest cries aloud.—Petit-Senn.

—Wisdom prepares pleasure by labor, and refreshes the laborer by pleasure.—Fenelon.

DYEING DEPARTMENT

Dye Recipes for April.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Recipe No. 49.

Yellow on Mercerized Cotton Yarn.

Diphenyl Chrysoine 3 G on 100 lbs. mercerized cotton yarn.

Prepare dye bath with

¾ lbs. Diphenyl Chrysoine 3 G.

(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter yarn at 170° F., bring to boil and dye at this temperature for one hour.

Diphenyl Chrysoine 3 G produces a fine shade of greenish yellow, is very strong and very fast to light.

Recipe No. 50.

Black on Worsted Yarn.

Anthracene Chrome Black F on 100 lbs. worsted yarn.

Prepare the dye bath with

¼ lb. Ammonium Oxalate.

5 lbs. Acetic Acid.

6½ lbs. Anthracene Chrome Black F.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

Enter yarn at 180° F. and boil 40 minutes. Then add

7 lbs. Sodium Bi-Sulphate

or

2½ lbs. Sulphuric Acid.

Add the above in two separate portions, and continue the boiling until the bath has only a reddish color.

Then add 1½ lbs. Potassium Bichromate, and boil gently ½ hour longer.

Anthracene Chrome Black F possesses remarkable fastness to light and milling, while its fastness to all the common requirements is good.

Recipe No. 51.

Scarlet on Cotton Yarn.

Benzo Fast Scarlet G S on 100 lbs. cotton yarn.

Prepare the dye bath with

4 lbs. Benzo Fast Scarlet G S.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

20 lbs. Glauber's Salt.

1 lb. Soda Ash.

Enter yarn at 170° F., bring to a boil and dye at this temperature one hour.

Benzo Fast Scarlet G S produces a brilliant shade of scarlet, which possesses all the characteristic properties of the direct cotton colors, and is exceedingly fast to milling.

Recipe No. 52.

Black on Worsted Yarn.

Anthracene Chrome Black 5 B on 100 lbs. worsted yarn.

Prepare the dye bath with

¼ lb. Ammonium Oxalate.

5 lbs. Acetic Acid.

6½ lbs. Anthracene Chrome Black 5 B.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

Enter yarn at 180° F. and boil 40 minutes.

Then add

7 lbs. Sodium Bisulphate.

or

2½ lbs. Sulphuric Acid.

Add the above in two separate portions and continue the boiling until the bath has only a reddish color.

Then add

1½ lbs. Potassium Bichromate, and boil gently ½ hour longer.

Anthracene Chrome Black F possesses remarkable fastness to light and milling, while its fastness to all the common requirements is good.

Recipe No. 53.

Dark Blue on Worsted Yarn.

Compound shade on 100 lbs. worsted yarn.

Mordant material in a bath containing

3 lbs. Potassium Bichromate.
2 lbs. Tartar.

Enter at 140° F., bring slowly to a boil and mordant at this temperature for 1½ hours, then dye in a bath containing

4 lbs. Anthracene Blue C P.
(C. Bischoff & Co., 87-89 Park Place, New York.)
½ lb. Anthracene Yellow G N.
(C. Bischoff & Co., 87-89 Park Place, New York.)
2 lbs. Acetic Acid.

Enter at 100° F., bring slowly to a boil and dye at this temperature 1½ hours.

The shade produced in this way will be found extremely fast to washing and fulling.

Recipe No. 54.

Blue on Cotton Yarn.

Tolamine Blue 2 B on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Tolamine Blue 2 B.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at this temperature one hour.

Tolamine Blue 2 B gives a remarkably blue and even shade, on both cotton yarn and union goods.

Recipe No. 55.

Brown on Worsted Carpet Yarn.

Acid Alizarine Brown B on 100 lbs. worsted carpet yarn.

Prepare the dye bath with

5 lbs. Acid Alizarine Brown B.
(Victor Koechl & Co., 122 Hudson St., New York.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid (added gradually).

Enter at 130° F., bring slowly to a boil and dye at this temperature one hour.

Then add

2 lbs. Potassium Bichromate.

and boil ½ hour longer.

Acid Alizarine Black R gives a pure shade of black which does not change in artificial light. Its fastness to light is excellent, as also its fastness to milling, while its fastness to all the common requirements is very good.

Recipe No. 56.

Green on Cotton Yarn.

Meridian Green on 100 lbs. cotton yarn.

Prepare the dye bath with

3 lbs. Meridian Green.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Meridian Green possesses all the characteristic properties of the direct cotton colors and may be used on union goods.

Recipe No. 57.

Cerise on Mercerized Cotton Yarn.

Direct Cerise B on 100 lbs. cotton yarn.

Prepare the dye bath with

6 oz. Direct Cerise B.
(Edwin M. Thayer, Boston, Mass.)
2 lbs. Common Salt (added after entering the goods).

Enter yarn at 180°, bring to a boil and dye at this temperature one hour.

Direct Cerise B exhausts the bath quickly, dyes very even shades, and is fairly fast to light and washing.

Recipe No. 58.

Black on Worsted Yarn.

Buffalo Black 4 B N on 100 lbs. worsted yarn.

Prepare the dye bath with

5 lbs. Buffalo Black 4 B N.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)
15 lbs. Glauber's Salt.

Enter at 180° F., bring to a boil. After boiling 15 minutes add gradually

3 lbs. Acetic Acid.

Boil 30 minutes longer and add gradually

3 lbs. Sulphuric Acid,

and then continue the boiling about 20 minutes longer.

Buffalo Black 4 B N produces an excellent black at a low cost, and is well worth the attention of those desiring such a color.

Recipe No. 59.

Bordeaux on Worsted Yarn.

Metachrome Bordeaux B on 100 lbs. worsted yarn.

Prepare the dye bath with

7 lbs. Metachrome Bordeaux B.

7 lbs. Metachrome.

(Berlin Aniline Works, 72 Front St., New York.)

10 lbs. Glauber's Salt.

Enter at 100° F., raise to the boil during ¾ of an hour, and then boil for a further hour, in order to completely fix the dyestuff. To this latter point especial attention is drawn since the dyeing operation must not be considered as being completed when the bath appears exhausted.

The fastness of Metachrome Bordeaux B to milling, light, air, alkalies and acids is excellent.

Recipe No. 60.

Yellow on Cotton Yarn.

Tetrazo Yellow R on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Tetrazo Yellow R.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

20 lbs. $Na_2 SO_4$.

1½ lbs. Soda Ash.

Enter at 170° F., bring to a boil and dye at this temperature for one hour.

Tetrazo Yellow R. gives an even and full shade of yellow and possesses all the characteristic properties of the direct cotton colors.

Recipe No. 61.

Black on Woolen Cloth.

Acid Alizarine Black R on 100 lbs. woolen cloth.

Prepare the dye bath with

6 lbs. Acid Alizarine Black R.

(Victor Koechl & Co., 122 Hudson St., New York.)

10 lbs. Glauber's Salt.

4 lbs. Sulphuric Acid (added gradually).

Enter at 130° F., bring slowly to a boil and dye at this temperature one hour.

Then add

2 lbs. Potassium Bichromate

and boil ½ hour longer.

Acid Alizarine Black R gives a pure shade of black which does not change in artificial light. Its fastness to light is excellent, as also its fastness to milling, while its fastness to all the common requirements is very good.

Recipe No. 62.

Yellow on Mercerized Cotton Yarn

Diphenyl Chrysoine 3 G on 100 lbs. mercerized cotton yarn.

Prepare the dye bath with

2 lbs. Diphenyl Chrysoine 3 G.

(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Diphenyl Chrysoine 3 G produces a fine greenish yellow, is very strong, and very fast to light.

Recipe No. 63.

Blue on Worsted Yarn.

Cyprus Blue R on 100 lbs. worsted yarn.

Prepare the dye bath with

4 lbs. Cyprus Blue R.

(Berlin Aniline Works, 72 Front St., New York.)

Dissolved in 100 times its weight of boiling water, to which is added

10 lbs. Glauber's Salt (previously dissolved).

5 lbs. Acetic Acid.

The whole is then boiled up and cooled to about 140° F. by the addition of cold water.

Enter the goods at this temperature, raise to a boil during ½ hour, and dye at this temperature for one hour.

The yarn is then after treated in a bath made with

3 lbs. Acetic Acid

and ⅓ to ½ as much copper sulphate as dyestuff used.

Enter at 140°, bring to a boil during ½ hour, and then continue the boiling ½ hour, then wash and dry.

The direct dyeings with Cyprus Blue R are of but little interest, but when after treated a shade is produced with excellent fastness to light, alkalies, and washing.

The Berlin Aniline Works have published a special sample and direction card on the Cyprus Blue and Green which they will gladly forward on application.

Recipe No. 64.

Brownjon Cotton Yarn.

Cachou de Laval R on 100 lbs. cotton yarn.

Prepare the dye bath with

2½ lbs. Cachou de Laval R.

(The St. Denis Dyestuff & Chemical Co., Sykes & Street, 85 Water St., New York, sole U. S. agts.)

1 lb. Common Salt for every gallon of water.

2 lbs. Soda Ash.

Enter the yarn at 180° F., bring to a boil, and dye at this temperature one hour.

The yarn is then after treated for ½ hour in a bath containing

5 lbs. Copper Sulphate.

5 lbs. Common Salt.

Enter at 120° F., and bring to 170° F. toward the end of the operation.

Cachou de Laval R is a concentrated type of this very important dyestuff.

Pneumatic Dyeing.

Two years ago a dyeing machine was invented by M. Dumons, for coloring textile materials under atmospheric pressure. Since then, experiments have been carried out to perfect the apparatus, and it has recently been on exhibition in Roubaix, France. Prof. Hoffman, who has examined the machine, gives the following description in L'Industrie Textile:

The inventors of the machine consider that now the apparatus has been brought to such a state of perfection as to warrant their showing it to the public, and subjecting it to the test of a practical trial. While the progress in the chemical branch of dyeing has been very greatly improved during the last fifteen years, it has not been accompanied by a corresponding advance in the mechanical branch of the art. The problem of manipulating textiles and subjecting each and every fibre to a uniform dyeing is yet to be solved.

The old system of coloring in open tubs has to a great extent been supplanted by modifications of these methods, but none of them solve the question completely, although many are excellent devices.

What must a perfect dyeing machine be able to do? It must enable the dyer to subject the raw material to a regular uniform treatment; it must give solid, permanent colors; it must enable the stock to be colored without injury to the fibre. To obtain solid, uniform colors, it is plainly necessary to secure a uniform circulation of the liquor through the material to be colored, in order to distribute the dyestuff uniformly. It is also necessary that the temperature of the liquor may be regulated in order to assure the solidity and uniformity of color; too rapid or too slow heating or an insufficient heating of the liquor may be the cause of failure.

Dyeing is the result of three processes: First, chemical action; second, the action of heat; third, mechanical action. It is evident that if the dyer be able to duplicate the conditions, he will be able to match the shades of different dips. Now the chemical action is independent of the kind of apparatus employed; it belongs purely to the domain of the chemist. The thermal and mechanical actions are, however, dependent upon the machinery or apparatus. It follows, therefore, that a perfect dyeing machine should give an absolutely regular circulation of the coloring liquor, and a uniform penetration of the fibre; it should permit of an exact regularity of the temperature, and should enable the dyer to duplicate these conditions at different times.

The best known dyeing machines in Europe are based upon the action of the centrifugal pump. The current obtained from these pumps is very far from being regular. It is more of a boiling, tumultuous action. There are places in the material which a current produced by the pump fails to effect, and this results in irregularity of shade and consequently the dyer is not able to determine even in an approximate manner the quantity of liquor that is circulated through the material in a certain time. Besides this, the temperature of the liquor is liable to be changed by the variations in the weather, and under certain circumstances, where a temperature above boiling is necessary, it is impossible to obtain it when a pump is employed.

It was to obviate these objections that M. Dumons invented his machine, which enables the dyer to subject all parts of the mass of textile material to like action from the dyeing liquor, independent of the variations in the pressure under which the material is placed in the tub.

These objects are attained by substituting air pressure for the pressure obtained from a pump. In this machine the speed of the circulation and the pressure of the dyeing material can be regulated by increasing or decreasing the air pressure. The change in the direction of the current is made at regular intervals, and by entirely automatic means. The coloring is done in a dye vessel, and the material is kept in an immovable position, which prevents any injury by felting, and the liquor is uniformly circulated through the entire mass of material to be colored.

—The widespread adoption of the protective policy is shown by the agitation in Norway to secure an increase in the tariff on cotton yarn in order to protect Norwegian manufacturers from their competitors in Sweden.

Treatment of Dyehouse Accidents.

Accidents that are most likely to occur in dyehouses, bleach and chemical works, may be divided into two general classes, viz., burns, scalds, etc., due to heat and acids; and poisoning, due to the accidental swallowing of some of the chemicals used in the works.

The first group, burns, are, no doubt, the most painful, and should be treated without delay. If the burn is caused by a splash of strong acid, such as oil of vitriol, the parts affected should be at once freed from any clothing, and at the same time large quantities of water should be poured on, the object being to wash away from both the clothing and afflicted parts all traces of acid.

If the acid has covered a large surface of the body, the injured party should be immediately put in a tub or vat containing water, and his clothing removed while in the water. Bad, or extensive burns from acid should be uncovered with great exercise of caution, and it will be found desirable to cut the clothing and lift it off of the person, in preference to drawing it off as is usually done.

After being assured that all traces of acid are washed away, the injured parts should be treated with raw cotton (if absorbent cotton is not at hand) soaked with water containing a very small amount of ammonia or bicarbonate of soda; this is to make absolutely certain the destruction of any acid.

Following this, the afflicted parts should be covered carefully with lint soaked in olive oil. Of course, it is supposed that in all cases where a severe accident has occurred, a physician has in the mean time been sent for. A frequent accident is splashing of corrosive liquids, acids, alkalies, etc., in the eyes. The immediate and continued application of cold water should be at once done until the arrival of a physician; the eye is too delicate an organ to be trifled with.

Burns from contact with hot coals, heated steam pipes, escaping steam, etc., should be at once treated with linseed or olive oil, applied preferably on lint, after uncovering the afflicted parts so as not to break the skin. A very useful preparation for all factories to have on hand is the simple mixture of:

Linseed Oil .....½ gal.
Lime Water .....½ gal.

for immediate use. This should be shaken, and applied by pouring on the afflicted parts, and spreading with soft cotton, finally covering with lint. Another formula for a similar preparation is:

Olive Oil .....½ gal.
Lime Water .....½ gal.
Salol .....½ oz.

this is applied in the same way.

In the absence of any of the above, it is well to have in mind that bicarbonate of soda (baking soda), white of eggs, whiting, or even paint, are excellent.

In case of poisoning, induce vomiting at once, by large draughts of hot water, strong mustard water, or by swallowing olive oil, or white of eggs. It is well to know that butter is one of the most useful antidotes for poison, not only soothing, but efficacious as an emetic. Administer it like oil, and give large doses.

If acids are swallowed, give soap suds, magnesia or lime water. Soap suds are always handy, and should be forced, if necessary into the stomach.

If alkalies are swallowed, give vinegar or lemon or lime juice, diluted with water.

In cases where iodine, tartar, emetic, or antimony salts are accidentally taken, administer, (for iodine) starch and water, and for antimonial salts, infusions of tannic acid. A case of tartar emetic poisoning was immediately treated by the writer with a large dose of sumac liquor from a mordanting tub.

Lead, copper, mercury, iron and cobalt salts, such as sugar of lead, bluestone, corrosive sublimate, copperas, etc., are best treated by the quick administration of soap suds and mucilaginous drinks, such as thinned gum tragacanth paste, or thinned gum arabic mucilage much used in textile mills.

Under the general name of Bug Poison is to be included the salts of the metals above mentioned, and they can be treated as above suggested.

There are some classes of "poisons," for which there is no direct neutralizing antidote, such as chloroform, ether, chloral, etc. The most urgent means to adopt is to induce respiration; dash cold water on the head and chest.

If poisoning is due to alkaloids, such as opium, morphine, soothing powders, etc., give a hot bath, and apply hot cloths to the stomach, at the same time administering strong, black coffee, and keep the person awake and always moving until the physician arrives.

In all cases of poisoning or of bad burns or scalds, whether in the mill, office, or the home, send some one at once for the physician.

The preceding notes are solely for immediate use, as the first few minutes of sensible application of proper antidotes will materially reduce the chances of subsequent complicated seriousness and probable fatality. Don't get excited, send for the physician, and administer the proper remedy.—The Review, published by Sykes & Street.

Acetates of Alumina, Lime and Tin for Printing.

A recent report of the Soc. Ind. de Mulhouse, gives the following formula for printing alizarine red:

3 Ltr. starch paste.
½ Ltr. olive oil.
1 Ltr. alizarine paste.
½ Ltr. acetate of alumina.
½ Ltr. acetate of lime.
½ Ltr. oxide of zinc paste.
½ Ltr. acetic acid.

The report states that acetic acid is well suited for dyeing with alizarine red, and that chrome acetate is better suited for steam colors.

Tannin as a Mordant in Dyeing Cotton.

Although tannin has been employed in cotton dyeing for years in connection with the basic coal-tar colors, its action is very imperfectly understood, and many dyers fail to obtain the best results from its use.

The usual procedure consists in entering the cotton in a warm tannin bath, poling it from time to time, and leaving it in the liquor for about six hours or over night.

Sumach, Myrabolan or similar material is often used, but these produce dark shades. Only the best grade of tannin should be used for bright colors. The fixing bath consists of a solution of antimony, tin, copper, iron or other metal, which will unite with the tannin, and form an insoluble tannate on the fibre. By submitting cotton prepared in this way to the action of the dye liquor, very solid colors are produced, owing to the strong affinity of the dye for the tannin.

The quality of the tannin should be regulated by the shade desired; for brown, olive or black it would be wasteful and useless to use the best grades of tannin; for such shades sumac and divi-divi answer well.

On the other hand, such tannins as the last named should never be used for bright shades; here, the best quality is required, as these colors depend entirely for their attractiveness upon the brightness of the shade.

The best method consists in bringing the tannin bath to the boiling point; then enter the cotton, and pole thoroughly for one half hour; let stand until liquor is cold to allow the cotton to absorb as much as possible of the tannin.

A large part of the tannin, estimated at 70 per cent. will remain in solution and can be utilized for succeeding dips of cotton; only enough tannin need be added for subsequent dyeings to supply the quantity already absorbed. The disadvantage of a standing bath is fermentation: this may be prevented by the addition of formalin or other antiseptic.

We come now to the second part of the operation. The cotton prepared according to foregoing directions is treated to a metallic solution by which an insoluble tannate is formed on the fibre.

It is evident that the various metallic salts such as those of antimony, tin, lead, iron, chrome, copper and cobalt, can be employed. Antimony and tin are mostly used as they form either a white or very light colored compound with the tannin, which has little or no influence on the subsequent color; lead is objectionable on many grounds; iron produces shades varying from grey to black; aluminum and chrome do not work well, and are seldom used.

Antimony gives the best results, and is used in the form of tartar emetic, antimony fluoride, double oxalate of antimony and potassium, double salt of antimony fluoride and ammonium sulphate, also chloride of antimony.

Other salts of antimony have been proposed as substitutes for tartar emetic, but the latter is the best. When pure it contains over 43 per. cent. of oxide of antimony, and comes in crystals or powder. The commercial product is seldom pure, and contains more or less ammonium or sulphate of potash added to reduce the cost. Such adulterated products are more expensive than the pure article.

The method of using this material is as follows: Tartar emetic varying in quantity from 1 per cent. to 2½ per cent. of the weight of goods to be treated, is dissolved in cold water. The cotton prepared with tannin is entered in this bath, poled for 15 minutes, and then lightly extracted. It is preferable to work the cotton in a hot bath for about ten minutes. The cotton should never be dried between the tannin and tartar emetic baths.

Fluoride of antimony contains more acid than tartar emetic; this may be counteracted by the addition of soda.

Oxalate of antimony is much used, and is a good substitute for tartar emetic; it contains 24 per cent. of ox-

ide of antimony, and is consequently weaker than tartar emetic, although it is more soluble than the last named salt.

The Textil-Zeitung says that the double salt of antimony fluoride and ammonia sulphate contain 46 per cent. of antimony oxide, or more than tartar emetic. Chloride of antimony has been proposed as a fixing agent, but is open to two objections. In the first place it contains much acid, and does not fix the tannin as well as tartar emetic, producing duller colors; and when dissolved in water much of the material is precipitated and lost; this precipitation may be lessened somewhat by the addition of salt.

Bleaching Wool with Bisulphite of Soda.

In order to obtain a clear white, much depends on the quality of the wool with which he is working, and to the careful carrying out of the preliminary scouring operations. The wool should be of a good white in its original state; dark colored wools cannot be satisfactorily bleached to a good white.

The preliminary washing and scouring operations must be properly carried out, in order to ensure the complete and entire removal of all dirt and grease, for if these are not taken out it is impossible to obtain a fine, clear, and uniform white. During the time the woolen goods are passing through the various scouring treatments every piece and every hank of yarn should be turned over and over and opened out so as to ensure its being uniformly treated. If this be done then the final bleaching will proceed properly and with entirely satisfactory results.

The process which is about to be described is carried out in the following manner for woolen piece-goods: Two vats are required. These should be made of wood only, as vats made from iron or copper often lead to the production of stains due to the formation of rust. These vats are fitted with the usual guide rollers and winding rollers.

One vat is used for the permanganate of potash, the other for the bisulphite of soda, and it is a good plan to have this fitted with a cover. Into the first vat is placed sufficient water; then for two pieces of 25 lb. weight each there is added ¾ lb. permanganate of potash dissolved in 5 to 6 pints of water and run into the vat through a sieve. The pieces are first wetted out well, and then run through the vat several times until they assume a pale brick red color and the vat liquor is free from the characteristic red color of the permanganate.

While this is going on prepare the second vat by adding the necessary amount of water, ½ to ¾ gallon of bisulphite of soda, and 3 lbs. of sulphuric acid. Now enter the pieces from the first vat and run through several times, when their color will change to a good white. Then place the pieces to steep for 12 hours or over night, putting the cover on the vat so as to prevent any loss of sulphurous acid gas, which is the active bleaching agent.

When the goods have been sufficiently steeped, take them out of the vat, wash thoroughly in water, and then allow to dry.

Woolen yarns are dealt with in precisely the same manner. It is a good plan, says the Textile Mercury, to arrange the vats so that the sticks carrying the hanks are hung below the surface of the liquor in the vats. From time to time the yarn is lifted out and turned over to ensure the uniformity of results. Should the goods come up with a slight yellowish tinge, which may occasionally occur (although the process, as a rule, gives a good, fine white), a warm vat is prepared, to which is added a very small quantity of methylene blue or methyl violet 6B, and the woolen articles run in this. The dye counteracts the effect of the yellow tinge of the goods and a fine white is obtained. Great care is needed not to use too much of the dyes, or the goods will not be white but will have a faint tinge.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Textile Charts.

Editor Textile World:

Please send me copies of your charts showing fluctuations in the prices of wool, cotton, wages, print cloths, worsted and woolen yarn, for the past eleven years.

Worth (91).

These charts are not published separately, but will be found in each number of the Textile World, with the lines brought up to the first of the current month.

Cotton and Linen Mesh.

Editor Textile World:

We desire to purchase cotton and linen mesh like the sample enclosed. Kindly inform us where we may do so.

Linen (90).

We have answered by mail.

Burling Cotton Goods.

Editor Textile World:

Regarding the enquiry of Cold Molasses in March issue as to the best way to burl cotton, my idea of burling cotton goods is to have two uprights, in which the roll of cloth can be fixed so it will run easy. Have a bar of wood, or roll, one foot above the cloth, then place two brushes so the cloth will run between the brushes. The brushes should run the opposite way from the cloth. Then place another bar, or roller, above the brushes. The operator can then pull the cloth over, and there should be two uprights with a pulley and roller, on which to wind the cloth. The cloth should run slowly, and what the brushes do not remove, a boy can pick from the cloth. I have used a device of this kind, and can inspect and burl the cloth at the same time.

Broadway.

Cost of Foreign and Domestic Textile Machinery.

Editor Textile World:

How does the cost of machinery for weaving cloth in this country compare with prices of similar machinery in England?

Broadway (100).

The cost of plain looms to the English manufacturer is about one-third less than the cost of similar machinery to the American manufacturer. This refers to unpatented machinery.

Dressing for Cotton Harnesses.

Editor Textile World:

Please inform me what will give a smooth finish on cotton harnesses, such as will make them proof against water.

Spruce (98).

There is no single preparation that we know of that will make cotton harnesses proof against moisture and give them a smooth finish. Harness manufacturers pass the harnesses through several operations to give them the desired finish; each manufacturer has his own preparation and method of treatment, which are not generally known. There are some very good harness varnishes on the market. See advertising columns.

Waste in Manufacturing Cotton.

Editor Textile World:

I will help you answer "Waste (71)," on page 522 of the Textile World for March. We have made extended and accurate tests to determine the amount of waste made on a comber combing Egyptian cotton, but recently made what is still better, a test from the bale to the yarn; we weighed 20 bales of cotton, and noted the product obtained in the different processes, finally weighing the yarn. Our gross loss was 33⅓ per cent. after selling the low waste, and also the back waste from the comber. Our net loss was very close to 28 per cent., and should judge the loss on the comber alone was about 16⅔ per cent., possibly a little more; 35 per cent. loss is a safe estimate on the general run of Egyptian or long staple Peeler cotton. If we were contemplating a large contract on yarns, made from either of the above cottons, we should charge off for waste not less than 30 per cent.

Boone.

This letter is from one of the best equipped fine cotton yarn mills in the country.

Silk Grain.

Editor Textile World:

What is the meaning of the word grain as applied to silk culture?

Palmetto (105).

The term grain (or graine) is applied to the eggs of the silk worm. They are very small, and a mass of them resembles cereal in the form of grain, from which we presume the term is derived. There are about 40,000 of these eggs in an ounce, and one ounce of grain produces from 80 to 120 pounds of cocoon, about 15 per cent. of which is pure cocoon.

Doup Heddles.

Editor Textile World:

Where can I purchase doup heddles?

Leno (104).

The L. S. Watson Manufacturing Company, Leicester, Mass., manufacture an extensive variety of doup heddles, and can doubtless furnish "Leno" with the kind he needs.

Statistics of the Woolen Industry.

Editor Textile World:

Where can we secure statistics regarding the woolen mills of the United States?

Import (101).

We published in the July, 1900, issue of the Textile World, statistics relating to the textile machinery in the United States at that time, and also made comparisons with similar statistics for the year previous, showing the growth of each branch of the textile industry during the preceding year. The figures relating to the woolen industry showed the number of sets of cards, and this will give a basis upon which to figure the spinning capacity in the woolen mills. In addition to these figures, the number of combs were given in the worsted branch, both spindles and looms for the cotton, knitting machines for the knitting, and both looms and spindles for the silk. These statistics we believe to be as accurate as any thus far compiled. They were taken from the Textile World's Directory, which includes every textile establishment in the country.

Cost of Selling Woolen Goods.

Editor Textile World:

Will you inform me as to the average cost for selling woolen and worsted goods? I notice in several of your articles on various current fabrics that you allow 20 per cent. for selling expenses; I read in a financial publication that the cost for selling the product of the American Woolen Co. is less than 3 per cent., while the cost of selling the goods of other mills not in the combination reaches 20 per cent. in some cases, and averages about 15 per cent. This difference appears large to me, but as the statement as to selling expenses of mills outside of the combine, agreed with your figures, I would like an explanation of how such a saving is effected.

Market (106).

The expense of selling woolen and worsted goods varies with different mills and methods of marketing the product. The regular terms at which woolen goods are usually sold are, 7 per cent. off 4 months 60 days; that is to say, there is a trade discount of 7 per cent.; and the buyer has six months in which to pay for the goods, or for which he can claim a discount at the rate of ½ per cent. per month, if cash is paid down. If the goods are sold through a commission house, there is a charge of 7 per cent. for commission. This 7 per cent. commission includes what may be called the real selling expenses such as store charges, bad debts, traveling expenses, salaries, insurance, advertising, and to a certain extent, storage.

Taking the case of goods selling at $1.00 per yard, we have:

Trade discount 7%	7 cts.
Six months' interest 3%	2 8/10 cts.
Commission 7%	6 3/10 cts.
	16 1/10 cts.

These three items amount to 16 1/10 per cent. of the selling prices.

In addition to these charges, discounts and commissions, there are other items charged to the manufacturer which swell the cost of selling; such as freight, and express, claims both just and unjust, cloth used for samples and cost of binding them; so that 20 per cent. is a moderate estimate for what are termed selling expenses of woolen and worsted goods by the usual commission house system. In some cases the manufacturer seeks to lessen the selling cost by various expedients; he may guarantee his own sales, that is, assume the risk of bad debts, but this system has its objections, as it involves many risks and the expenditure of much time on the part of the mill owner. Then again the manufacturer may sell his own goods, but it is generally recognized that the advantage by this method lies not so much in a reduction of selling expenses as in the closer touch with the trade in which the producer is brought.

The discount of 7 per cent. and time given on bills for woolens and worsteds are established customs of the trade applying to all goods alike, whether sold by the American Woolen Co. or any other concern. There are a few exceptions which it is not necessary to refer to here; we are giving the general rule followed. The sales of this combine for last year were, according to the official report, about $29,673,000. We have heard it estimated in commission circles that their yearly salary list in the selling department amounted to $700,000. Assume, however, that it is but $500,000, this would amount to about 1 7/10 per cent. of the sales, and leaving 1 3/10 per cent. to cover the 7 per cent. trade discount, 3 per cent. interest on time given, and all the other charges we have named exclusive of salaries of salesmen. The financial journal has evidently forgotten either to leave out items on one side or to include them on the other.

Knit Goods Dyehouse.

Editor Textile World:

Please inform us as to the best arrangement for a knit goods dyehouse, handling 100 dozen men's cotton ribbed underwear per day. We would like a list of the necessary machinery.

Knit (96).

Our correspondent will find an article on this subject in this issue of the Textile World.

Hammock Machine Wanted.

Editor Textile World:

Where can I buy a hammock machine?

Hammock (95).

We have answered by mail, and should be pleased to put anyone interested in communication with our correspondent.

Spindle and Traveler.

Editor Textile World:

A work on cotton spinning, recognized as an authority on the subject, states that in ring spinning the twist is imparted to the yarn by the traveler. I am unable to understand the author's reasoning, and write to ask you to give in language easily understood an explanation of the action of the traveler and spindle in twisting and winding yarn in ring spinning.

Doubter (93).

Many arguments have been advanced to decide the question as to whether the ring or the spindle twists the yarn. They have had but one result, viz., to confuse the reader's ideas as to the exact action of these two essential parts of a ring spinning frame. If a decision on the question must be made, the credit for twisting will be awarded to the spindle, since yarn can be twisted by the spindle without the aid of the traveler as in the case of mule or cap spinning, while twisting cannot be done by the traveler without the spindle.

The traveler is required to hold the yarn in such a position that the latter may be wound on the spindle as delivered by the rollers; it is movable, that the yarn may be revolved freely by the spindle; in other words, it is a movable guide for the yarn, and in ring spinning serves the same purpose that the faller wires do in mule spinning.

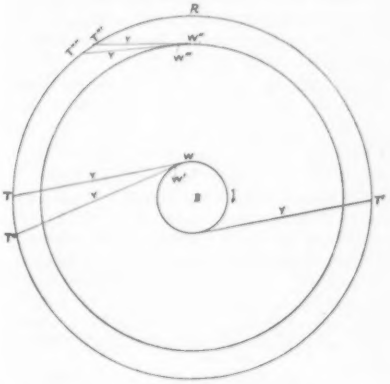
In the last named process, the spinning and twisting are done separately; consequently, when the yarn is being twisted, only the spindle is in operation, the faller wires, which are substitutes for the traveler, being idle. The fallers are brought into action only when the yarn is to be wound, and then act as guides, the winding being effected by the revolutions of the spindle. Winding and twisting being continuous operations in ring spinning, it is necessary to have a movable guide (the traveler) guiding the yarn as it is wound. Referring to the accompanying plan of a spindle ring and traveler, the traveler is dragged around the ring (R) by the yarn (Y), which is being wound on the bobbin (B). If no yarn is delivered, the traveler makes one revolution to each revolution of the spindle. If during one revolution of the spindle the yarn is delivered equal in length to the circumference of the bobbin at the point where yarn is wound, or in other words, if the yarn is being delivered as fast as the spindle can wind it, the traveler may be held stationary. If, however, yarn equal to one-half of the bobbin circumference be delivered, the traveler will be dragged one-half the distance round the ring, and at the completion of the revolution of the spindle, be found at T'.

Take the case of a ring frame, with front roller running 142 revolutions and delivering 500 inches of yarn per minute, the spindles running 10,000 revolutions per minute, the nose of the bobbin 1½ inches in circumference, and the base of the cone or greatest diameter of the bobbin, 4½ inches in circumference; we find by dividing the delivery of yarn per minute (500 inches) by the number of revolutions of the spindle (10,000), that 1/20 of an inch of yarn is delivered at each revolution of the spindle.

At the nose of the bobbin, where the circumference is 1½ inches, this 1/20 of

an inch is 1/30 of such circumference; consequently, the traveler will fall behind, for the distance T″, or 1/30 of one revolution, in order to retain its relative position with, or what might be called the winding point on the bobbin which has changed from W to W′.

When the yarn is being wound on the greatest diameter of the bobbin, we still have 1/20 of an inch of yarn delivered for each revolution of the spindle, while the circumference of the bobbin is 4½ inches. In this case, the 1/20 inch delivered is but 1/90th of this circumference; consequently, the ring will fall behind the bobbin but 1/90th of the circumference of the ring, or from T‴ to T⁗ in order to maintain the same relative position with the winding point on the bobbin which has moved from W″ to W‴. In order to



wind the yarn at the smaller diameter, it is necessary to employ more of the spindle movement than at the large diameter; more revolutions are employed at the nose of the bobbin to wind the yarn than at the base of the cone or greatest diameter.

One turn of twist is given to the yarn at each complete revolution of the yarn on its axis; such revolution corresponds with a revolution of the traveler; and would also correspond with a revolution of the spindle, if the spindle were not required to wind the yarn; as it is, the traveler is constantly falling behind the spindle. We have already shown that this difference of speed between spindle and traveler varies with the diameter of the bobbin at the point where winding is taking place; the traveler is revolved faster by the spindle when bobbin is larger, and as one turn of twist is given to the yarn at each revolution of the yarn on its axis (which corresponds with one revolution of the yarn guide or traveler), it follows that more twist is given to the yarn when being wound on the larger part of the bobbin.

This difference of twist is effected gradually as the ring rail carries the yarn slowly from the nose of the bobbin to base of the cone. In the aggregate it is very small; take the case already cited; when winding at the nose of the bobbin the traveler falling 1/30 of a revolution behind the spindle at each turn of the latter, will revolve 9667 times per min., while the spindle revolves 10,000; when winding at the base of the cone, the traveler falling 1/90 of a devolution behind the spindle at each turn of the latter, will revolve 9889 times per min., while the spindle revolves 10,000; consequently the additional twist given to the yarn when being wound at base of cone is at the rate of 222 turns per minute; as 500 inches of the yarn is delivered per minute, this difference in twist is equal to .444, or not quite ½ of a turn per inch. Three things serve to equalize this difference in the yarn; first, it is effected gradually with the traverse of the ring rail; second, the twist is imparted to the yarn not at one point, but to the length of yarn between the traveler and the delivery rolls; third, twist has a tendency to run into the fine places, and as no yarn is absolutely perfect, it will contain more twist in these finer places.

Cotton Goods Wanted.

Editor Textile World:

We desire to purchase about 10,000 yards per day of goods like the enclosed sample. The goods are to be 22 inches wide, and may be woven in three widths, if desired.

Cotton (86).

We have samples, of these goods, and will take pleasure in submitting them to any manufacturers interested in this inquiry.

Linen Goods.

Editor Textile World:

I would like to know what the statistics are as to the amount of linen goods consumed in this country.

Ono (59).

There are no statistics from which to form any trustworthy idea of the quantity of linen goods consumed. The U. S. Treasury Department does not classify the imports of linens separately. They are included along with jute, hemp, sisal grass, and similar goods. The total value of such goods imported during the twelve months ending June 30, 1899, was $25,035,336. To find the quantity consumed

the value of the goods manufactured in this country should be added to this amount, and unfortunately the government statistics of manufactures do not give the quantity of linen goods manufactured in the United States.

Uneven Dyeing of Knit Goods in the Roll.

Editor Textile World:

I was very much interested in the question and answer on this subject last month, and think your answer will very likely remedy the difficulty. There is one other point I would like to mention, which I think frequently causes uneven dyeing in a long 6-draught kettle, such as "Dyer" is probably using, and that is the unevenness in the temperature of the liquor. With a perforated steam pipe running along front of kettle it almost always happens that one part of the kettle is heated to a higher temperature than another. I have tested it, and found a variation of from 10 to 15 degrees in different parts of the kettle, and this, of course, would make quite a difference in delicate shades. The only way that I know of to avoid this, if you are using that sort of a kettle, is to change the pieces from one end to the other frequently, so they will get a fair average dyeing.

Uniform (64).

Book on Silk Ribbon Weaving.

Editor Textile World:

Where can I obtain information in regard to the manufacture of silk ribbons?

Pine (97).

Les Metiers a Tisser le Ruban, by C. Lebois, is the title of a book treating of the weaving of silk ribbons. The different types of looms used at different times in the development of this industry are described and illustrated. The price is $3, and we can import it, if desired.

Book on Velvet Weaving.

Editor Textile World:

Where can I obtain a book on velvet weaving?

Sammet (89).

We are acquainted with no book on velvet weaving published in the English language, and if such a work exists, we would be glad to have information in regard to it.

Length of Leg in Ladies' Hosiery.

Editor Textile World:

In the January issue you published a list taken from the Dry Goods Economist, which states that ladies' hose should be made with a 27-inch leg. We have always followed the rule of making the leg three times the length of the foot, and if we are making 28-ounce goods, the smaller sizes will weigh less and the larger sizes more than 28 ounces, but the average will be this weight. Please advise me which method is correct.

Length of Leg (100).

The rule for misses' hosiery is to have the leg three times the length of the foot, while ladies' hosiery, in 8, 9, 9½ and 10 sizes have the legs one uniform length of about 28 inches. The weight, of course, will depend upon the size of the yarn and gauge of machine, and if these are kept uniform, will be less for the smaller sizes and more for the larger sizes, the medium size representing the average weight of the goods. An experienced knitting superintendent writes us that some manufacturers find it too much trouble to make half sizes in the leg, and, consequently, in misses' goods they make them as follows:

5 and 5½ .....15¾-inch leg.
6 and 6½ .....18¾-inch leg.
7 and 7½ .....21¾-inch leg.
8 and 8½ .....24¾-inch leg.
9 and 9½ .....27¾-inch leg.

He states that the adoption of this rule saves a great deal of trouble, and is extensively used by manufacturers having a limited number of ribbers. We publish in another part of the present issue an article on this subject written by a man well posted in the trade, and who realizes the importance of a uniform system of sizes.

Amount of Capital Required in the Woolen Business.

Editor Textile World:

What amount of capital do you consider would be required per loom in the manufacture of fine worsted and woolens for men's wear?

Waverly (99).

The capital required per loom would depend upon whether the goods were to be manufactured from the raw material or from the yarn. In the former case, it would, of course, require more money to handle the business. Then again, the amount of capital required would depend somewhat upon the size of the plant and whether the mill was leased or owned by the manufacturing company. For active capital, exclusive of the cost of the plant, we would consider that $1500 per loom would be sufficient for a woolen mill manufacturing goods from the raw material. For a worsted mill purchasing yarn, and only warping, dressing and finishing the goods, possibly the business

could be handled with $1000 per loom. The cost of a new mill is a rather uncertain quantity, as much depends upon the style and equipment, buildings, etc. We should consider $2000 per loom would be a fair estimate for the cost of a woolen mill equipped to manufacture from the raw material.

Typewriter Ribbons.

Editor Textile World:

Please give us the names of some manufacturers of typewriter ribbons.

St. Paul (92).

Answered by mail.

Market Conditions.

Editor Textile World:

Please give me information in regard to the market for hosiery. I am interested in a hosiery mill enterprise, and before going ahead would like to know more about market conditions.

Old Kentucky (94).

We refer our correspondent to the knit goods review in the Textile World for information in regard to the hosiery market. We would advise extreme caution at the present time in embarking upon new enterprises in the textile industry, if you do not know the business thoroughly.

Cotton Yarn by the Woolen System.

Editor Textile World:

Please inform me what New England mill is spinning cotton yarn by the woolen system.

Merrimac (87).

We have answered by mail. Would like to hear from any such mills.

Reed Tables.

Editor Textile World:

Where can I secure reed tables?

Dent (70).

You will find complete reed tables among the Simplex Tables in the Textile World's Directory.

Felt for Stamping Pads.

Editor Textile World:

Can you tell us where we can buy felt suitable for covering stamping pads used in hosiery mills?

Stamp Pad (80).

We have answered by mail.

Loss in Scouring Yarn.

Editor Textile World:

What per cent. of the weight of unscoured yarn is lost in scouring? What is the difference in cost between scoured yarn and the same yarn in the grease?

Wooly West (81).

No definite answer can be given to the first question as the percentage varies with the quality of the stock and the amount of oil used in the manufacture of the yarn. The loss will vary from five to 20 per cent., and can be easily tested by reeling 100 grains of the yarn, scouring and drying it, and then reweighing to determine the loss. The difference between the cost of scoured and unscoured yarn depends upon the shrinkage, and can be easily determined by dividing the cost per pound in the grease by the number of grains of scoured yarn obtained from 100 grains of the grease yarn. For instance, if the yarn cost 34 cents in the grease, and the test showed that there was a loss of 15 grains (or per cent.) in scouring, the cost per pound clean can be found by dividing 34 by 85, which would give 40 cents, the cost per pound scoured.

New Publications.

A Short Treatise on Finishing Analysis by Dr. Wilhelm Massot, teacher in the Prussian textile school, Grefeld. Julius Springer, Berlin, price $1.50.

This work has been compiled to provide manufacturers and chemists with a handbook in which they might find practical methods of determining the various materials used in finishing. It is a frequent objection to works on industrial chemistry, that they deal too much with the theory and general observations on the subject, and fail to meet the requirements of the practice in our mills. The author of this work, a teacher in the Prussian High School for the textile industry, has had a good opportunity during many years, of meeting the various questions coming up in practice, and has been called upon to solve many of these problems presented to him by manufacturers throughout Germany. With the experience thus obtained, and his knowledge of chemistry, he has been able to compile a work which comes very close to the work of the mill. The following abstract of the table of contents will give our readers an idea of the scope of the work. Section 1. The determination of the inorganic finishing materials; the presence of nitrates and muriates in water, and testing for lead, copper, tin, alluminum, iron, zinc, alkaline earths, lime, baryum, magnesia, soda, potash, and ammonia; also, the organic and inorganic acids. Section 2: treats of the determination of organic finishing materials, and gives tests for water, alcoholic solutions, ether, petroleum, benzin, benzol, emulsions, free fats and oils, also fixed and partly fixed fats and soaps. Tests for grape sugar

and cane sugar, glycerine, starch, dextrine, gum, size, albumen, the general characters of fats and fatty substances, resins, etc. The next section treats of the examination of the finished goods, and a table is added giving the reactions of the more important organic finishing materials in the presence of various substances. This work can be imported through the office of the Textile World.

Artificial Silk, Its Production, Characteristics and Use, by Dr. Carl Suvern, 125 pages; illustrated; accompanied by dyed samples of artificial silk; Julius Springer, Berlin, price $2.50.

The artificial silk industry has developed in Europe so that it bids fair to become one of the permanent branches of the textile trades. Its origin and growth have been so recent that very little literature exists bearing on the subject, and it was for the purpose of collecting the scattered material relating to artificial silk that Dr. Suvern has written this book. He has evidently used great care in the work, and the result is a valuable manual of the artificial silk industry. The first section of the work is devoted to artificial silk from nitro cellulose. The author describes the various processes, Chardonnet, Gerard, du Vivier, Lehner, Bronnert und Schlumberger, Kniffer, Strehlenert, Loncle und Chartrey, Oberle und Newbold, Cadoret, und Breuer; this section ends with a chapter on the spinning machine invented by Wilhelm Strehlnert. Then follow descriptions of the various processes for producing artificial silk from other than nitrous vegetable materials, such as the processes of Langhans, Pauly, Despaissis, Dreaper und Tompkins, Fremery und Urban, Cross und Bevan, and Stearn. The third section is devoted to the various methods of producing artificial silk from materials of animal origin. The fourth section treats of the various methods of coating animal and vegetable fibres with nitro cellulose or other silk material. Then follows a section treating of the physical and chemical properties and characteristics of the various kinds of artificial silk, and the action of dyestuffs and chemicals on the artificial silk fibre. The concluding section of the work deals with the various uses of artificial silk. An appendix is added, showing samples of several different kinds of artificial silk, in the form of the dyed thread and braid material made into a fringe. This book can be imported through Textile World office.

L. Industrie des Tulles et Dentelles Mechaniques dans le departement du Pas-de-Calais by Henri Henon, 616 pages profusely illustrated. Price $6.00. This elaborate work treats of the lace industry of Calais from its establishment to the present time. As its title indicates, it is devoted to the mechanical branch of the industry, the brief account of hand made lace being included in the first chapter. It is for this reason that the book will appeal strongly to readers in this country where the establishment of this trade is now occupying much attention in various quarters.

We cannot give a better idea of the scope of this work than by quoting from the preface as follows:

"We have recorded in this volume the conditions under which the lace industry was established at Calais; how it has been developed and altered; and finally its condition at the end of the nineteenth century. We have traced step by step the constant progress made in this industry for over a century from the first machine which was subjected to almost daily improvements, whose usefulness and possibilities were greatly widened by the invention of 'la bobine,' and marvelously transformed into a veritable creative power by the invention of Jacquard; we have noted the various steps in its development down to the modern lace machine of the present time, which works such marvels, both in the reproduction of the classic laces produced by hand, and in the varied productions designed to supply the demands of fashion." The illustrations are a leading feature of this work. They bring before the reader the beautiful designs in the light and delicate lace textures. The various lace machines and mechanical devices employed in this industry are also shown in numerous illustrations and drawings. The Textile World will import the book for anyone desiring a copy, upon receipt of price.

Directory of the Austrian Cotton, Spinning, Weaving, Printing, Bleaching, Finishing and Oil Cloth Industry, with a list of the Principal Knitting, Embroidery and Lace Works. By Prof. A. L. Jackman. Wilhelm Braumuller, k. k. Universitats-Buchhandlung, Wien. Price $3.00. This, as its name indicates, is a directory of the various textile mills in Austria named in the title, and is very well arranged, showing at a glance the principal establishments in each town, city or department. A very elaborate colored map is furnished with the directory, showing the location of the concerns mentioned in the work. They are indicated by signs of various colors, each branch of the industry having a particular color and design assigned to it, so that the location of different establishments in each line can be determined at a glance. The map is so arranged that not only is the location of the mills indicated, but also the relative importance of each locality from a textile manufacturing point of view.

The Textile World will import this book for anyone desiring a copy, on receipt of price.

International Congress for the Unification of Yarn Numbering. Compiled by M. Ferdinand Roy, Paul Fleury, Paris, France. Price $1.50. This is a summary of the proceedings of the recent congress held in Paris, for the unification of yarn numbering throughout the world. The subject is of great importance to the textile trade, and these proceedings contain much that will interest manufacturers and operatives.

Proceedings of the Annual Meeting of the Silk Association of America. Held March 6, 1901. This is the regular publication issued by the Silk Association, giving the secretary's annual report, the names of officers and various papers read at the meeting. It is a particularly interesting number, owing to the interesting report of Secretary Allen, and the technical papers which were read at the annual meeting.

Disk and Propeller Fans. The B. F. Sturtevant Company, Boston, Mass. This is catalogue No. 116, 16 pages, showing the various types of disk and propeller fans manufactured by this well known concern.

New Dye Cards Recently Received.

Diamineral Brown G. William J. Matheson & Company, Ltd., New York, N. Y. This card contains ten samples of cotton yarn, two of sateen, two of bevertine, two loose cotton, one satin, and one Italian cloth, colored with Diamineral Brown G. Formulas and directions for coloring are given for both union, cotton and silk, and clear cotton goods.

Benzo Fast Red L. Farbenfabriken of Elberfeld Co., New York and Boston. This sheet shows samples of cotton goods colored with Benzo Fast Red L; also, three samples printed with the same dye. Directions for dyeing and formulae are also given.

Wool Fabrics Fast to Washing. Wm J. Matheson & Co., Ltd., New York. This card contains ten fancy woolen fabrics, which show the merits of the Diamine colors. Each one of the samples has white in contrast with the colors, and the white shows up very brightly.

Cyanolgrun B. Wm. J. Matheson & Co., New York, N. Y. This card contains 16 samples colored with the Cyanole dyes. Formulas in English, German and French are given.

Anthracene Chrome Black. Wm. J. Matheson & Co., Ltd., New York. This book contains a number of samples of knitting and worsted yarn, slubbing, loose wool, and felt, colored with Anthracene Chrome Black; also, several fancy patterns in which the black is colored with the same dye. Full directions and formulas accompany the samples.

Clean Waterproof Belts.

The manufacturers of Cling-Surface claim that it has the value, aside from its prevention of slipping and its increasing the transmiting power, of making belts waterproof, so that wet or dry weather makes no difference in their running. They state that as Cling-Surface is a filler, it permits the belts being kept perfectly clean, not making them sticky, and when a belt is once filled it need not be filled again, except for an occasional slight surface application.

Sizing Compounds.

The Arabol Manufacturing Co., 155 William St., New York, are among the largest manufacturers of sizing compounds, softening oils, softeners, etc. They are well equipped for producing strictly modern compounds, based upon the best practical and scientific experience that can be obtained. Their facilities for supplying the needs of mills as regards sizings, softeners and finishing compounds for warps and fabrics are first class. When ordering sizing, etc., a full explanation is necessary as to the class of goods, also whether the water is hard or not, and the kind of "feel" required; in order to be sure of obtaining the very best goods, for any particular work.

They recommend their Sizoleum and soluble softening oil mixed with either corn or potato starch for colored warps. The former is also adapted for use on print cloth warps, sheetings and domestics. No tallow should be used with it. The Arabol Gloy G is adapted for either light or heavy sizing of cotton warps and is especially recommended for use on export goods, such as china shirtings, drills, denims, coarse and medium goods, etc. Gloy G strengthens the starch both in volume and adhesive power, giving elasticity and tensile strength. The warp sizes AA and AAA are adapted for medium and fine yarns; they also may be used on colored warps. They give smooth finish and good weaving qualities. The soluble softening oil is one of the finest softening or sizing oils on the market. It is superior for use as a softener, and is said to be much superior to tallow. The manufacturers state that the softening oil is always reliable and summer or winter remains in sweet condition, that it gives a smooth finish to the warps, the threads divide well in the lease rods, and that the cylinders of the slasher keep clean as a penny. It is said to be neutral, easily handled and most suitable for strong or close woven goods, such as corduroys, velveteens, sateens, twills, umbrella cloth, cambric warps, etc.

The Arabol Company, 155 William St., New York, will be pleased to give information on this subject to any parties interested.

Suit for Infringement.

The Draper Co., Hopedale, Mass., has entered suit against the American Loom Company of New Jersey, for infringement of patent.

—H. G. McKerrow & Company, Boston, Mass., report the following orders for Tweedales & Smalley's machinery, for which they are American agents: W. H. Rowe Knitting Company, entire equipment of slubbing, intermediate and roving frames for their new mill at Huntsville, Ala.; Hadley Peoples Manufacturing Company, Siler City, N. C., slubbing and roving frames.

—The American Moistening Company, Boston, Mass., have recently received the following orders for their humidifying apparatus: Buffalo Cotton Mills, Union, S. C., complete equipment; American Spinning Company, Greenville, S. C.; Brandon Mills, Greenville, S. C.; Pacolet Mills, Pacolet, S. C.; Saxon Mills, Spartanburg, S. C.; Jackson Fibre Company, Jackson, Tenn.; Home Cotton Mills, St. Louis, Mo., De Kalb Cotton Mills, Camden, S. C. They also have the following repeat orders: Nashua Manufacturing Company, Nashua, N. H.; F. W. Poe Manufacturing Co., Greenville, S. C.; Eagle & Phoenix Mills, Columbus, Ga.; Everett Knitting Mills, Lebanon, N. H.; Lawrence Manufacturing Co., Lowell, Mass.; Wm. H. Grundy & Company, Bristol, Pa.; and the Monument Mills, Housatonic, Mass.

The James Smith Woolen Machinery Co's Works.

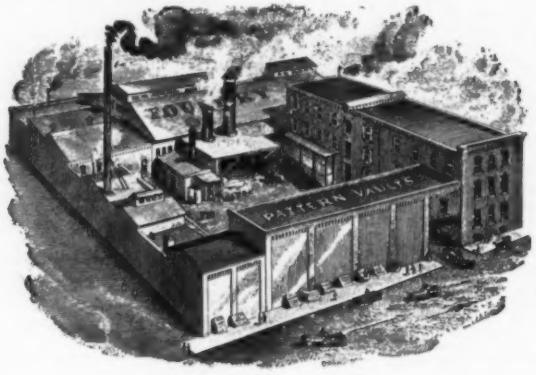
The illustrations show views of the general offices and machine shops of the James Smith Woolen Machinery Co., Fourth and Arch Sts., Philadelphia, and foundry and machine shop at Emerald and Adams Sts. These give some idea of the extent of their works, where they turn out a complete line of woolen machinery from raw stock to the loom.

This includes the various types of preparing machinery, such as garnetts, burr pickers, dusters, wool and mixing pickers, rag pickers, washers, of various lengths and widths, stock dryers, both automatic and table pattern, for either hot or cold air; Apperley and Blamire feeds, automatic self-weighing feeds for first breaker and garnett, automatic self-feeders for pickers, washers and willows; card and garnett grinders of various patterns, turning rests, etc., spoolers, dressers, beamers, ring dusters and reels.

They build spinning machinery in the shape of mules, both light and heavy pattern, and of American or English design, also the Platt English pattern mules, jacks, etc.

Their modern card, which they call "The Twentieth Century Card," contains the latest features.

They make a specialty, as well, of power transmitting machinery, shafting, both cold drawn and turned; pulleys, both iron and wood, and all patterns of hangers, bearings, etc., and friction clutches.



FOUNDRY AND SHOPS.

This, together with their general textile and mill supply department, enables them to furnish everything that a woolen mill is in need of, and, indeed, many mills are equipped with the Smith machinery throughout. They strive to keep their machinery up to date in every respect, and as it is built from improved patterns and with tools especially for the purpose, accuracy is insured and duplication of parts made easy.

Inquiries are solicited and plans and estimates cheerfully furnished.

GENERAL OFFICES AND MACHINE SHOP
JAS. SMITH WOOLEN MACH. CO.

—The Worcester and Blackstone Valley Street Railway are building a model power plant at Millbury. Among the up-to-date features will be noted the Green Economizer.

American Bridge Company.

The New York Central R. R. has awarded to the American Bridge Company the contract for 28,000 tons of steel work, comprising several hundred spans, which is the largest single contract for bridge material ever let by any railroad company in the United States. This road expended nearly $2,000,000 for bridge work last year, and will expend an equal amount this year. The American Bridge Company also have the following orders recently received: New Astor Building, corner 55th Street and 5th Avenue, New York, N. Y., three thousand tons of steel work; Custom House, New York, N. Y., two thousand tons of steel work; Pennsylvania R. R. Company, Pittsburg, Pa., Liberty Street Bridge; Schultz Branch of Pittsburg, Government warehouse at Progresso, Yucatan; Central R. R., of New Jersey, at Weissport, Pa., twelve spans of deck plate girders, 75 feet long; Chicago & Alton Road, 4000 tons bridge work; Chicago, St. Paul & Missouri Railway, thirty-six bridges.

—At the annual meeting and dinner of the Middlesex County School Masters' Club, held at the Quincy House in Boston, on Saturday, March 9th, Mr. C. P. Brooks, Managing Director of the New Bedford Textile School, and Director of the American Correspondence School of Textiles of New Bedford, was the guest of the club and gave an address on Industrial Education, with special reference to Textiles.

Potash.

Electrolytic Caustic Potash 90 per cent. has been on the market for a number of years, and the manufacturers and dealers, A. Klipstein & Co., Box 2833, New York, have found this article to be very efficient in securing clean goods at a minimum of cost. They claim first, that its purity is over 98 per cent. on a dry basis, and 90 per cent. actual K O H, as packed; second, solubility and freedom from objectionable soda salts; third, its relative cheapness, the production on a large scale by electrolysis producing the cheap as well as uniform products. Potash soaps have been used for a longer time, and much more freely in Europe than here. The present tariff permits caustic and carbonate of potash to come in free of duty, thus enabling manufacturers to avail themselves of this important scouring agent.

Messrs. Klipstein & Company furnish the following as the result of analyses made of this article and others.

AVERAGE ANALYSES.

	Best brands old process Caustic Potash.	Electrolytic 90% Caustic Potash
Potassium Hydrate (K O H)	72.21%	87.50%
Potassium Carbonate ($K_2 C O_3$)	3.24	2.76
Potassium Chloride (K Cl)	....	1.50
Sodium Hydrate (Na H O)	2.00	....
Sodium Chloride (Na Cl)[2]	2.13	.28
Water (by difference)	20.42	7.96

Analyses of two samples 70-75%, received from a customer's factory:

Sample No. 1—70-75%, 55-56, K O H.
Sample No. 2—70-75%, 53-61, K O H.
Electrolytic—87.50%, K O H.

This is a matter of great importance to the woolen and worsted manufacturers of this country, the general excellence of whose product is largely affected by the thorough cleansing of the goods.

Machine for Vigoreux Printing.

A machine has been recently invented in France for improving the methods of printing for vigoreux mixtures. It consists in a series of knives, each one of which is dipped into a compartment filled with a particular colored dye. These knives are operated so as to be immersed in the dye and then raised by being pressed against the sliver; at the same time a pad or support is brought in position under the knife and the material to be printed, and in this manner a very thorough impregnation of the fibre is secured. A variety of fancy fabrics have for many years been produced by the use of yarns which have been printed in the slubbing. There is nothing specially difficult in the operation. A special form of printing machine is required, which is capable of printing the slubbing in bands by means of fluted rollers, the width of the flutes determining the width of the bands, and therefore the proportion of the slubbing printed on. Such machines can be bought. For preparing the printing pastes the acid series of dyes give good results. After the printing the slubbing may be subjected to a slight steaming, although this is not absolutely essential. It is then rinsed in water in such a machine as the Obermaier, every care being taken that the slubbing is not tangled or disturbed during the operation.

Power Transmission.

The entire power transmitting machinery consisting of pulleys, couplings, hangers, collars and including a mile of shafting from three to nine inches in diameter, for the distribution of 2,000 h. p. throughout the immense new plant of the Singer Manufacturing Co., South Bend, Ind., now in course of erection, will be furnished by the Dodge Manufacturing Co., of Mishawaka, Ind. In Machinery Hall at the Pan American Exposition, Buffalo, one of the working exhibits will be operated by a Dodge American system Rope Transmission. Taking power from a 250 h. p. Murray engine, the rope will operate a 16x16 inch Roots Rotary Pump with capacity of 2500 gals. per minute at a speed of 180 RPM. Intending visitors should make note and be sure to see this.

Sanitary Fast Black Hosiery.

A. N. Dubois, 2170 Sedgley Avenue, Philadelphia, is the inventor of a process for coloring hosiery a fast black, which, it is claimed, possesses superior sanitary properties; it has been adopted by many of the leading hosiery manufacturers throughout the country, and has received strong endorsements not only from them, but from the wearers of the goods.

Mr. Dubois has introduced other dyeing processes, the first of which was a method of dyeing bristles and horse hair, which is used by many manufacturers of these products. The desirability of a sanitary fast black on cotton was first called to his attention by a prominent manufacturer, who asked Mr. Dubois if he could furnish a formula for such a dye. He replied that he would try, and immediately began a series of experiments, which resulted in the production of the dye which is now placed in the market, under the name of "Sanitary Fast Black." Mr. Dubois states that the color produced with this dye will stand an acid test, is cheap, practical, and produces a very brilliant shade. He guarantees the nonpoisonous character of the dye.

Mr. Dubois adopts very thorough methods in introducing this dye into textile mills. He gives his personal attention to the matter, and begins by a thorough analysis of the water used, then teaches the process to a number of persons in the mill, and superintends the erection of the machinery that the best results may be obtained. He has recently introduced the dye into the Pond Lily Company's mill, at New Haven, Conn. This is the fourteenth concern to adopt the process, some of the others being Nolde & Horst, Reading, Pa.; A. T

Harris & Sons, E. G. Chester & Company, E. Sutro & Son, Thomas Buck & Company, Brown Brothers, and Eberley & Company, all of Philadelphia; The Scotland Neck Cotton Mills Company, Mankato, Minn.; Eddystone Manufacturing Company, Eddystone, Pa.; and the R. D. Wood Company, Millville, N. J.

—The Deep Leeds Transmission Co. of Australia recently installed a Cross Oil Filter made by The Burt Mfg. Co. of Akron, Ohio, in their Electrical Power Station.

—The Green Fuel Economizer Company, Matteawan, N. Y., have recently received an order from the Rhode Island Suburban Railway, Providence, R. I., for their equipment of heaters to 7000 horse power of water tube boilers, and from the Cambridge Electric Light Company, Cambridge, Mass., for their new power station.

The Buffalo Forge Company, Buffalo, N. Y., have issued a circular describing their laundry blower. Parties interested may secure a copy by addressing the above named firm.

Johnson Vertical Knit Goods Dryer.

This dryer is meeting with much success among underwear mills. Among recent new orders received by the manufacturer, E. M. Antisdel, of Utica, N. Y., is one from the Oneida Mills, one of the oldest and largest mills in that section. They are putting in two of the machines now, and expect to put in more later. The Capron Knitting Co. at Capron, N. Y., have replaced their former horizontal dryers with six of the Johnson vertical dryers.

To Detect Artificial Silk.

Natural silk dissolves in an alkaline solution which remains white, while with artificial silk the solution turns yellow. Another method for distinguishing natural from artificial silk is the following: Artificial silk is not soluble in an alkaline copper solution when glycerine is present, while natural silk dissolves in it at ordinary temperature. This test is so sensitive that by means of it the relative quantities of natural and artificial silk in a tissue can be ascertained. The solution is prepared by dissolving 10 parts of sulphate of copper in 100 parts of water. To this are added 5 parts glycerine and potash in sufficient quantity to again redissolve the precipitate that has been formed.—Kuhlow's.

Hosiery and Underwear Yarns.

The Barnesville Manufacturing Company, Barnesville, Ga., are manufacturers of hosiery and underwear yarn from Peeler, or Egyptian cotton, bleached or in any desired colors. They are also finishers and bleachers of piece goods, underwear, towels, yarns, etc. They have adopted for the hosiery manufactured by them, the well known Johnson formula for oxidized black. They guarantee all of their work, and solicit correspondence from manufacturers interested. Their New York office and salesroom is at 910 New York Life Building.

Testing Black.

The Deutscher Farberverband gives the following simple tests for identifying black on cotton goods: Sulphur blacks, such as Vidal or immedial black, are readily recognized by heating a swatch in a test tube with a little stannous chloride and hydrochloric acid and holding a lead paper in the escaping vapors; if the paper turns brown or black, the dyestuff contains sulphur. Aniline black is characterized by turning green on treatment with cold hydrochloric acid, and imparts the same color to the acid; if the material gives a green ash, announcing oxide of chromium, the black has been produced by the one-bath method. Such a black also rubs very much compared to "aged" black. Direct blacks are recognized by the ease with which they blend into whites, if boiled together with a little soda. The well-known characteristic reaction for logwood black is to turn dark red with dilute sulphuric acid, and to color the acid. If the material at the same time gives a red-brown ash, the black has been bottomed with tannate of iron.

Trade with Nicaragua.

A National Museum, to promote the development of commerce and with a section devoted to foreign commerce and industry, has been established in Managua, capitol of Nicaragua, for the public display of fabrics from foreign lands. Manufacturers of goods suitable for use in Nicaragua are invited to make exhibits of their products at this museum; such exhibition will be free of cost. In the case of bulky products, it is suggested that only small working models, or a set of photographs, be submitted. Correspondence in regard to the matter may be addressed to A. S. Straus, Consul General for Nicaragua, 18 Broadway, New York, N. Y. It is expected that this museum will be an important factor in the promotion of trade between Nicaragua and foreign countries.

Wool Grease for Waterproofing.

Dr. Berthier, of the French army, has published an interesting paper on wool grease in the "Revue d'Hygiene." In looking for a waterproof material for the soldier, who cannot wear rubber on the march, even if it were cheap enough, since it does not allow the perspiration to escape, it occurred to him to try wool grease. The Arabs wear cloaks of wool still containing their natural grease; these fabrics are impermeable to moisture, but also smelly. Berthier experimented with purified colorless and odorless wool grease, lanoline. Dissolving it in petroleum essence, he impregnated the garments, either by dipping them into the solution and removing the excess by wringing, or by applying the solution with the help of a sponge. Neither process is exactly satisfactory, but waterproof garments can be obtained in this way. Lanoline is expensive; he obtained it in Roubaix, at 62 cents per lb. So little lanoline is, however, needed that the solvent constitutes the chief item of expense in this new process.

Is Now General Manager.

Frederick A. Wildes, who for the past four years has been assistant manager of the A. T. Atherton Machine Co., of Pawtucket, R. I., was recently elected to the position of general manager by the directors of that company. Mr. Wildes was formerly with the Geo. W. Stafford Mfg. Co., which afterwards became the Providence branch of the Crompton & Knowles Loom Works, and is widely and favorably known to the trade. His promotion is a well earned recognition of his success with the company.

Polishing Metals.

The following recipe for a powder with which to polish metals, is given by La Revue Technique:

A small quantity of salt of sorrel is added to a solution of green vitriol; a pale yellow precipitate is thrown down which is an oxalate of iron; this is filtered, dried and then subjected to a moderate heat of an oven to expel the oxalic acid; the residue is oxide of iron in the form of a very fine powder, and gives good results in polishing metals.

Decimal System.

The Decimal Association, of England, has issued its annual report, which states that instruction in the principles of the metric system has been made compulsory in some of the departments of the English common schools. At the congress of the Chambers of Commerce of the British Empire, held in London, June last, a resolution was passed recommending that Parliament legalize the metric system in all parts of the British Empire, except India. It is expected that a conference to promote the adoption of the decimal system will be held at Paris before long, at which will be represented Great Britain, United States, and Russia. The report notes a marked growth of public opinion in both Great Britain and the United States, in favor of the metric system of weights and measures.

The Canadian government is seriously considering the adoption of this decimal system, and in Russia like progress is being made. Iron and steel manufacturers in Germany have adopted a uniform system of dimensions, based on the metric system. These classifications are making more and more progress in Germany, not only in iron trades, but also in other manufactures. Two new books were published in 1900, treating of the metric system: one by S. Jackson, M. A., and the other by J. Lingham Lees, B. A. Representatives of the leading English trade unions continue warm supporters of this decimal system. The report gives a long list of members of Parliament who have expressed themselves in favor of the compulsory adoption of the metric weights and measures. Arrangements have been made by which popular lectures on the metric system can be given in the principal cities and towns of Great Britain.

Recreation Room for Employees.

The American Manufacturing Company, New York, N. Y., have fitted up a recreation room for the girls in their employ. This room is on the top floor, and is provided with a piano, a merry-go-round, and a library containing a large number of volumes. It is expected that a swimming tank will be added in the near future.

The Graphite Industry.

The development of the graphite industry furnishes the material for a fascinating and marvelous story, beginning way back beyond the dark ages. Geologists have made us familiar with wonderful preserved specimens. So far as yet known, Ceylon holds the largest and richest deposits of graphite. The next source of supply is said to be the new famous Ticonderoga mines of the Joseph Dixon Crucible Company. The export of Ceylon graphite must have commenced between 1820 and 1830, as Joseph Dixon, the founder of the American Crucible Company, received a shipment of plumbago in 1829. In 1827, Mr. Dixon made crucibles of plumbago found in New Hampshire. The quality of the New Hampshire product was much superior to the Dutch black lead pots. Mr. Dixon afterwards saw specimens of the graphite from Ceylon, which were shown to him by captains in the East India trade and who exhibited them as curiosities. Finding these samples much superior to the New Hampshire plumbago, he imported what was the first shipment of Ceylon graphite to the United States. The graphite industry in this country, therefore, really began with the founder of the Dixon Company. It was his fertile brain that conceived the possibilities of graphite, and it was his skilled hand which first gave to the world graphite crucibles and the celebrated "Carburet of Iron" stove polish, which has brightened the stoves of three generations.

Textiles in Smyrna.

A recent U. S. consular report states that a large importer of cotton goods in Smyrna is reported to have said that English manufacturers are losing their hold on that market, owing to sharp American competition—which should, however, be in direct hands and not in that of middlemen. In T cloths, the British article has been steadily declining in favor of American "cabots," especially cabot "A." The Lancashire "Mexicans," though better finished than the American articles, are less durable, and are therefore less sought. America furnishes several kinds of white shirtings, which are considered superior to the British manufactures. Prints from the United Kingdom are suffering from the importation of inferior goods from continental factories and from the revival of a locally manufactured kind of print called "aladja," made of pure cotton yarn dyed in fast colors, cleverly imitating the European designs. The aladjas are very durable, and the demand is steadily augmenting in the interior. For some time past, the United States has also been supplying prints, which appear to be gaining favor with the natives. Drillings (gray and blue) are chiefly from the United States.

—The American Bridge Company is furnishing to Wm. Young & Co., Mexico City, Mexico, eight bridges to be erected over the Sacramento Canal at Torreon, Mexico.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Elba. The Elba Manufacturing Co. has been incorporated with capital stock of $200,000 by Col. W. J. Comer (Savannah, Ga.), J. C. Henderson (Troy, Ala.), F. P. Rainer and W. J. Boyd of Elba. They will manufacture cotton and woolen goods. Work will be started on construction of building early in May.

—Alabama, Sylacauga. It is reported that another cotton mill is to be erected here by Dr. J. E. Pearson and associates. Land has been purchased and work will soon be started on construction.

—*Alabama, Talladega. The Chinnabee Cotton Mills have commenced building their mill, and expect to have it ready for the new crop. Machinery is ordered.

—*Alabama, Uniontown. The new mill of the Ellawhite Cotton Mills has been completed. At a recent meeting of the stockholders and directors, W. J. White was elected president; S. T. Whitfield, vice-president and Val Taylor, secretary and treasurer.

—*Georgia, Augusta. The Davis Cotton Mills, incorporated by Charles Davis and others, with capital stock of $200,000, have made application for a charter. They propose erecting a cotton mill with equipment of 10,000 spindles and 360 looms. This refers to the project previously reported under Weinona, S. C., as the Weinona Cotton Mills.

—Georgia, Cedartown. The Standard Cotton Mills expect to start work during April or May upon a new building for purpose of increasing the capacity to 12,500 spindles.

—*Georgia, Eatonton. The large plant of the Middle Georgia Cotton Mills is nearing completion, and they will soon start installing the machinery equipment.

—*Georgia, Fitzgerald. The main building for the Irwin Cotton Mills has been completed and the machinery will now be installed. Operations will be started as soon as practicable.

—*Georgia, Hampton. The machinery is being rapidly set up in the new plant of the Hampton Cotton Mills and operations will be started at an early date. This company, of which W. M. Harris is manager, will make hosiery yarns.

—*Georgia, Lawrenceville. The Gwinnett Cotton Mills, of which M. S. Cornett is president; J. H. Duggan, secretary and treasurer, and H. P. Carter, superintendent, will be ready to start production of goods about March 15th. Yarns for knit goods will be made.

—*Louisiana, Minden. The people of Minden and Webster Parish are organizing a cotton factory at Minden, and wish to correspond with a man of experience and ability who would become financially interested with them and superintend the plant. F. H. Drake and Thomas Crichton, of Minden, La., should be addressed.

—Massachusetts, Westfield. A new concern will shortly start manufacturing thread at this place; viz: the Cressy Thread Co., of which George Cressy is at the head.

—*Mississippi, Lexington. The Lexington Cotton Mills, J. E. Stanfield, secretary and treasurer, will receive bids until April 1st for erection of the necessary buildings for the plant.

—*Mississippi, Winona. The capital stock of the Winona Cotton Mills have been increased from $100,000 to $125,000. They propose starting operations June 1st.

—*Mississippi, Yazoo City. Work is soon to be started on erection of the buildings for the Yazoo Cotton Mills Company.

—North Carolina, Lenoir. M. M. Courtney is president and J. D. Moore, Gastonia, secretary of new company recently organized here with capital stock of $100,000 to build and operate a cotton mill.

—*North Carolina, Oxford. The buildings of the Oxford Cotton Mills have been completed and the machinery is being installed. The company, of which J. G. Hall is president and C. J. Cooper, treasurer, contemplates having the mill in operation in about a month.

—North Carolina, Peachtree. W. C. Culbertson of this place is interested in establishment of a 2500-spindle mill at this place.

—North Carolina, Shelby. Application for a charter, to organize company with capital stock of $50,000, will be made by J. H. McBrayer, J. F. Ledbetter, E. L. Jenkins and others. Subscriptions are being solicited toward the enterprise.

—*South Carolina, Greenwood. Work will be started at once on erection of the Greenwood Co.'s No. 2 mill.

—Rhode Island, Westerly. The old machinery in the mills occupied by the new concern known as the Solway Mills, is being removed and new machinery installed. About 50 looms have already been received and put in position.

—*South Carolina, Greer Depot. The machinery is being installed in the Franklin Mills, which contemplate starting production of yarn about April. W. W. Burgess is president and treasurer of the concern; M. B. Cunningham, secretary and J. F. Burgess, superintendent.

—*South Carolina, Inman. Work has been started on construction of the new buildings for the Inman Cotton Mills. It

is proposed to have the plant ready to start production of goods September 1st.

—*Tennessee, Humboldt. The machinery is being installed in the Humboldt Cotton Mills, which recently made a satisfactory arrangement for what further funds may be required until the bonds can be sold to good advantage. They will put the plant in operation as soon as possible.

—*Texas, Bonham. The machinery is being installed in the Bonham Cotton Mills, ofw hich John C. Saunders is manager. As previously reported, the company expects to be in operation about the middle of May.

—*Texas, Celeste. Application will be made at once for charter for the Celeste Cotton Mill Company. The directors will purchase a site for the mill, which is to be equipped with 3,500 spindles. It is expected that the plant will be ready to start operations by September.

—*Texas, Cuero. Work has been started on foundations of the Cuero Cotton Mill. This company, of which J. A. Graves is president, and F. B. Sames, treasurer, is capitalized at $100,000. Mill will have an equipment of 2500 spindles and 160 looms.

—Texas, Houston Heights. The Oriental Textile Mills have been incorporated by Samuel E. Allen, Isaac W. Walker, John S. Radford, Joseph B. Bowles and Fred C. Robertson, with capital stock of $50,000. They will manufacture yarns and other textile fabrics.

—*Texas, Paris. The Paris Textile Mill Company has been incorporated with capital stock of $150,000 and will soon begin work on erection of the cotton mill. J. A. Varner is president and H. H. Kirkpatrick, secretary and treasurer.

—*Texas, Pittsburg. The Pittsburg Textile Manufacturing Co. has been organized with capital stock of $25,000, with G. C. Hopkins, president, and W. C. Hargrove, secretary and treasurer. Site has been purchased and work will soon be started on erection of plant.

—*Texas, Waxahachie. Operations have been started making thread in the Waxahachie Cotton Mills. As soon as some more of equipment arrives, they will start manufacturing cloth.

Enlargements and Improvements.

—Georgia, Hogansville. A series of bonds will be issued by the Hogansville Manufacturing Co. for purpose of making enlargements and improvements to the plant.

—Georgia, West Point. The West Point Mfg. Co., L. Lanier, president, is making arangement for enlarging the plant for purpose of increasing the output to about 600,000 lbs. of duck per month.

—Kansas, Independence. The Kansas Cotton Mill Co., which has been reorganized, will increase the number of spindles from 2000 to 3000.

—Massachusetts, Fall River. The Granite Mills are installing 50 new looms in the No. 3 mill.

—Massachusetts, Lowell. A new storehouse, 128 by 96 feet, is being built for the Tremont and Suffolk Mills.

—Massachusetts, Lowell. The Appleton Company contemplates erecting a four-story brick addition to its No. 6 mill soon, to be used for storage of finished goods.

—Massachusetts, North Abington. A. C. Woodward has installed 15 new looms in the mill and will manufacture strapping for shoes in addition to other lines.

—*Massachusetts, Shirley. Operations have been commenced in the new building recently completed by the Samson Cordage Works.

—Massachusetts, Taunton. The Whittenton Manufacturing Co. has increased their capital stock to the amount of $200,000.

—New Jersey, Millville. An additional story (making four) will be built to the Millville Mfg. Co.'s plant.

—New York, Long Island, Patchogue. Additional buildings will be erected and new machinery installed in the Patchogue Manufacturing Co.'s plant. In addition to manufacture of lace curtains, lace collars and Swiss embroidery will be made in the mill.

—New York, New York Mills. An addition to be used for finishing and cutting corduroys, is being built to the Burstone Mills of the New York Mills Co.

—*North Carolina, Albemarle. The Wiscassett Mills Co. have completed installation of 5000 additional spindles in the plant, giving them a total of 20,000. They have suspended night work for time being, owing to condition of the cotton market.

—*North Carolina, Concord. The addition to the Cabarrus Cotton Mill is nearly completed and machinery will soon be placed in position.

—Pennsylvania, Philadelphia. The Wabash Mills Co., of which Arthur N. Leeds is president; Walter B. Stokes, treasurer and Samuel Stead, superintendent, has equipped the Castle Bank Mill with machinery for making cotton and wool double reel carpet yarns and blanket yarns. They do not expect to move into the new quarters until fall.

—North Carolina, Spray. The capital stock of the Nantucket Cotton Mills has been increased from $125,000 to $225,000. An enlargement will be made to the plant.

—Rhode Island, Lonsdale. A large addition is to be built in the spring to the bleachery and dye works of the Lonsdale Company's plant. They will also install new machinery in the addition, when completed.

—South Carolina, Blacksburg. The Cherokee Falls Mfg. Co. is to erect an addition to the mill. Contract for building has been let.

—South Carolina, Jonesville. At a recent meeting of the stockholders of the Alpha Cotton Mills, J. J. Littlejohn was elected president, succeeding W. L. Littlejohn, deceased. He will also retain position of treasurer. The company will

install 3000 additional spindles in the plant, which will give them a total of 8000 when completed.

—Tennessee, Chattanooga. The Vance Cotton Mill, which has started up after a short shut down for purpose of installing additional machinery and making some repairs, contemplates making further enlargements to the building.

—Virginia, Ettricks. New machinery is being added to the equipment of the Pocahontas Cotton Mill, which will make a further enlargement to the plant during the year.

Mills Starting Up.

—*Connecticut, Baltic. The Baltic Mills have started operations. Harold Lawton, formerly of the Lawton Spinning Co., Providence and Woonsocket, is superintendent of the large plant, of which details have been previously reported.

—*Mississippi, McComb City. Operations have begun in the McComb City Cotton Mills, and in about 30 days, company expects to have the plant running in full.

—*New Jersey, Passaic. Operations have been started up in the Brighton Mills, recently removed here from New York City.

—*North Carolina, Goldsboro. The Borden Manufacturing Company has started production of yarns and will soon be running on full time with a night and day force.

—*North Carolina, Raleigh. Operations have been started in the Neuse River Mill, and the company expects to have the plant running in full shortly. Sheetings will be manufactured at present.

—*North Carolina, Staley. We have been informed by W. G. Robertson, supt. of the Enterprise Mfg. Co., that there is no new mill to be erected here, but that he has bought the Staley Cotton Mill property and is making alterations and improvements preparatory to putting same in operation, making single and ply yarns.

—*Rhode Island, Woonsocket. Nearly all of the 76 looms in the National Pile Fabric Co.'s mill have been put in operation.

Mills Shutting Down.

—Alabama, Spring Garden. The entire plant of the Hurricane Creek Manufacturing Company has been shut down. Operations will be resumed Sept. 1st.

—*Georgia, Toccoa. The Capps Cotton Mill has suspended operations for a time, pending on the condition of the market. This company manufactures only yarns.

—Maryland, Elkton. The mill recently established by Diebert & Wilson has been temporarily shut down, owing to cut off of water supply.

—South Carolina, Yorkville. The Sutro Cotton Mills have been shut down temporarily.

Woolen.

New Mills.

—*California, Agnews. H. G. C. Atwater is president; J. G. Scott, treasurer and R. H. Duncan, agent and superintendent of the Lick Woolen Manufacturing Company, recently incorporated with capital stock of $250,000. They expect to start operations about July, making flannels, blankets, cassimeres and possibly knit goods later. Will equip buildings, which they have purchased and which will be remodelled, with 4 sets cards and 20 looms. A dye house will be attached to the plant. Company's office is at 3639 Nineteenth Street, San Francisco. Have as yet made no purchases of machinery.

—Maine, Newport. Work will be started early in the spring on erection of a wool factory, by J. H. Weymouth. The main building will be 77 by 45 feet, 3 stories, with boiler house, 20 by 32 feet and storehouse, 24 by 60 feet. About 30 people will be given employment in plant, when completed.

—Mississippi, Corinth. The Corinth Woolen Mills have been incorporated with capital stock of $52,500 by J. R. Curlee, J. C. Stanley, S. L. Nelson and S. H. Curlee. They propose manufacturing cotton goods in connection with woolen.

—New Jersey, Paterson. The Paterson Wool Extract Company has been incorporated with capital stock of $25,000 and will manufacture wool extracts. This concern will operate mill formerly occupied by James E. Daly. The incorporators are: Abram Kammerling and Paul and Henry Van Haste.

—Pennsylvania, Hummelstown. A small carpet weaving shop will soon be started up by S. L. Groff. He has purchased a building and has installed one of the latest improved looms for the purpose.

—*Rhode Island, Oakland. About 60 new looms have now been installed in the Coronet Worsted Co.'s plant.

—*Virginia, Basic City. The Shenandoah Woolen Company has been organized with capital stock of $25,000 to operate mill here for manufacturing blankets. D. A. Williams is president of the concern; Eugene A. Roby, vice-president, and Theodore A. Sammis, secretary and treasurer. We believe J. J. Bockee, a second hand machinery dealer of New York, is promoting this concern.

—*Virginia, Winchester. About $10,000 worth of machinery will be purchased and installed in the Virginia Woolen Company's plant, now nearing completion. They expect to have entire plant running by April 1st.

Enlargements and Improvements.

—*California, Santa Rosa. The new machinery is being installed in the Santa Rosa Woolen Mills, and will be put in operation as soon as possible.

—Connecticut, Rockville. Contract has been let by the Springville Mfg. Co. for the erection of a new boiler house, 30 by 43 feet, brick.

—*Maine, Skowhegan. Several new looms have been installed in the Ander-

son Woolen Mills, which have started up again after short shut down.

—Maine, Gardiner. The Cobbosseecontee Woolen Co. will install 10 more looms in the mill at once.

—Massachusetts, Fitchburg. The American Woolen Company has recently installed 78 new looms in the Fitchburg Worsted Mill.

—Massachusetts, Lawrence. Work has been started on erection of a new engine house, three stories high, for the Washington Mills of the American Woolen Co. A 2,000 h. p. engine and a 2,000 h. p. generator will be installed.

—Massachusetts, Plymouth. An addition is to be built to Geo. Mabbet & Sons' woolen mill. New looms will be installed.

—Massachusetts, West Millbury. An addition, 32x40 feet, 2 stories, is to be built to the Millbury Scouring Co.'s plant. The addition will be equipped with new machinery for carbonizing and scouring.

—Michigan, Sheboygan A. B. Ellis, rug weaver, has moved his establishment to a new building, where the facilities will be greatly increased.

—Missouri, St. Louis. The Mayfield Woolen Mills, which have purchased the Old Kentucky Woolen Mills from Geo. W. Tarlton, will remove the plant and machinery to this place, where they propose erecting a new woolen factory, in addition to buildings recently purchased.

—New Jersey, Bloomfield. New worsted machinery is being installed in Thomas Oakes & Co.'s plant.

—New York, Lestershire. The Faatz-Reynolds Felting Company has been incorporated with capital stock of $350,000, with W. G. Faatz, president; C. F. Reynolds, vice-president; W. C. Kings, secretary, and G. H. Faatz, treasurer. This company succeeds the Faatz Brush & Felting Co. The capacity of the plant will be enlarged.

—New York, Middletown. A three-story addition to be used for a wool scouring department is under construction to the Wallkill Hat Works.

—Ohio, Cleveland. The F. Muhlhauser Company will make extensive additions to the plant this spring and have issued bonds to the value of $350,000 to pay for same.

—Pennsylvania, Philadelphia. Additional looms have been installed in the Star Woolen Mills, James Stafford's Sons, proprietors. They also operate a department for making carpet yarns, from 45s to 60s.

—Pennsylvania, Tunkhannock. The capital stock of the Winola Woolen Yarn Company, has been increased from $30,000 to $50,000.

—Pennsylvania, Upland. Plans are under way for an enlargement to Walworth & Son's shoddy mill.

—Virginia, Fredericksburg. The Melville Woolen Company will build an addition to the plant and will start manufacturing chambrays and silk goods for dresses and waists. Mr. James Good, of New York, will have charge of the new department.

Mills Starting Up.

—Arkansas, Nashville. Operations will soon be resumed in the Nashville Woolen Mills which will be enlarged and improved under a new management.

—Indiana, Indianapolis. The Model Woolen Co.'s plant, which has been idle for a number of years, has been purchased by D. A. Chenoweth, for $26,000. Extensive repairs will be made to the mill and operations resumed.

—*Iowa, Nashua. W. J. Bowen, who has recently purchased the Nashua Woolen Mills, informs us that the mill will be started up about May 1st, making cassimeres, horse and bed blankets, flannels, dress goods, prison cloth and hosiery yarns. This is a three set mill, operated by water power.

—Massachusetts, Hampden. The plant of the Hampden Mills Co. has been closed.

—Pennsylvania, Philadelphia. Operations have been temporarily suspended in H. C. Ball & Co.'s mill, Main Street, Manayunk.

—Rhode Island, Lafayette. The woolen mills of the Rodman Manufacturing Co., will shut down March 30th, for an indefinite time.

—Rhode Island, Westerly. Operations have been resumed in the mills of the Westerly Woolen Company.

Mills Shutting Down.

—Pennsylvania, Philadelphia. The Edward Mills, Indiana Avenue, have been shut down indefinitely, owing to ill-health of Mr. G. Pleissner of Remy, Schmidt & Pleissner, who are interested in the concern.

Knit.

New Mills.

—*Alabama, Tuskaloosa. The Rosenau Hosiery Mills have been incorporated with capital stock of $50,000; D. L. Rosenau, president and M. D. Rosenau, treasurer. This plant, which expects to start production of goods in about another month, is located in the old wadding mill, which was absorbed by the trust.

—Connecticut, Norwich. A knitting mill, for manufacturing hosiery, will soon be started up in the Marguerite Building by J. B. Shannon. The mill will have capacity of 500 dozen hose per day.

—Delaware, Wilmington. The Diamond State Hosiery Co. has been incorporated with capital stock of $125,000 to manufacture and sell hosiery and all kinds of knit goods. Wm. S. Prickett, is president; Francis E. Gallagher, treasurer and John L. Sulphen, secretary and manager.

—*Georgia, LaFayette. We have been advised by P. D. Fortune, who is interested in the new company being organized for purpose of erecting a knitting plant, known as the Elizabeth Hosiery Mills, that company will be capitalized at $25,000, nearly all of which has been

subscribed. As soon as charter has been granted, they will place contracts for buildings, machinery, etc.

—*Georgia, Social Circle. We have been advised by B. G. Smith, that nothing definite has yet been done regarding establishment of a knitting mill here, no organization having been formed, nor any stock subscribed.

—Georgia, Valdese. John Meier will be superintendent of another new hosiery mill located in plant formerly operated by him.

—*Louisiana, New Iberia. The New Iberia Cotton Milling Company, Ltd., capitalized at $50,000, which has started work on construction of the buildings, expects to have the plant ready to start operations in May. They will begin in a small way, starting with fourteen machines for making fleece lined and balbriggan underwear, using steam and electric power. J. P. Suberbielle is president; A. B. Murray, treasurer; Wm. Magee, general manager and M. J. Walsh, superintendent of the company. F. M. Farber & Co., New York, will sell their goods.

—Massachusetts, Waltham. A new building to be equipped with machinery for manufacturing general knit goods, is to be erected on Dale Street, for Alfred Tomlin. Work has been started on foundation.

—Mississippi, Columbus. We have been advised by J. B. Bell that he has completed organization of a stock company with capital of $30,000, for purpose of erecting a mill to make ladies' hose and men's half hose. Before starting active work, he is desirous of obtaining all possible information regarding the project.

—*New York, Utica. The Fisher Knit Goods Company has been incorporated with capital stock of $30,000, by Michael J. Fisher, Boardman L. Fitch and Frank B. Charles. They will manufacture all kinds of knit goods, making a specialty of sweaters. They will lease a building, equipping it with Fisher machines and starting operations at earliest convenience.

—*North Carolina, Enfield. Dr. John A. Collins is president; E. N. Ricks, treasurer; Geo. W. Kersey and T. A. Hollingsworth, superintendents of the Enfield Knitting Mills, recently incorporated with capital stock of $10,000. Children's ribbed hosiery, will be made. Mill will be equipped with 10 knitting machines. Are still in the market for some of the equipment.

—*North Carolina, Shelby. Machinery has nearly all been installed in the buildings recently purchased by J. F. Williams to be operated on hosiery, and work will soon begin on production of goods. Mr. Prim will be superintendent of the mill.

—*North Carolina, Valdese. The Waletension Hosiery Mill, in which John and Francois Garron and Antoine Grill are interested, will start operations April 15th, making fast black children's hose.

—North Carolina, Wadesboro. The Hargrove & Leak Manufacturing Co. has been incorporated with capital stock of $10,000 (to be increased to $50,000) by Frederick Hargrove, James A. Leak and John Leak. They propose erecting a mill for manufacturing underwear.

—*Pennsylvania, Dauberville. Work will be started about May 1st in the Dauberville Knitting Mills, recently established here by Messrs. H. K. Phillips, and H. M. and H. R. Loose. Ladies' ribbed underwear will be made. The new building will be equipped with 5 knitting machines and 5 sleevers. The use gas engines, which with other necessary appurtenances, have not yet been purchased.

—*Pennsylvania, Mohn's Store. The Worley Hosiery Co. is name of the new concern which started operations February 1st., in new mill, making men's half hose. The mill has 9 knitting machines. F. B. Berlin, N. Y., sells the goods.

—Pennsylvania, Philadelphia. The Harold Hosiery Mills Co., recently organized, has purchased the plant of M. B. Laubach, 2d Street and Allegheny Avenue. Full fashioned hosiery is made at the mill.

—Pennsylvania, Pottsville. A new hosiery mill will soon be put in operation here by James Aikman, Jr. Work has been started on excavations for the new building, which will be 30 by 45 feet. About 20 machines will be installed at first.

—Pennsylvania, Schuylkill Haven. A new mill is under construction to be operated, when completed, by Edw. W. Beck and Charles Smith. They will manufacture knit goods.

—Pennsylvania, Shippensburg. The Shippensburg Knitting Company has been formed with Jacob E. Railing, president; Frank E. Hollar, secretary and treasurer and Hugh Craig, superintendent. They expect to have the plant, which is to be located in the Opera House now being remodelled, in operation by May 1st., making men's half hose. Later they contemplate manufacturing ladies' hosiery and underwear.

—*South Carolina, Landrum. The Blue Ridge Hosiery Mill Co. has let contract for construction of buildings for their new plant. The main building will be 35 by 75 feet, 2 stories, and will have capacity of 300 dozen pairs per day. Joseph Lee is president and treasurer of the concern. A dye house will also be attached to the mill.

—South Carolina, Rowesville. The Crum Company has been recently incorporated with capital stock of $10,000, and will establish a knitting mill here.

—Tennessee, Shelbyville. W. L. Wilhoite is looking up the knitting business with the idea of starting a plant, if he finds the prospects are favorable. He is yet undetermined whether to make hosiery or knit goods, and is carefully considering the question before going ahead. If he finally concludes to start the mill, a company will be formed with about $10,000 capital stock.

—*Virginia, Staunton. The Massanutten Knitting Company has been incorporated with capital stock of from $25,000 to $50,000, with D. A. Williams, president, and Theo: A. Sammis, secretary and treasurer. This is the concern with which J. J. Bockee's name was formerly mentioned as promoter.

Enlargements and Improvements.

—Delaware, Smyrna. An addition is to be built to the Smyrna Shirt & Hosiery Factory. New machinery will be installed at an estimated cost of about $4000.

—Georgia, Penfield. Eighteen new machines have been installed in the Penfield Hosiery Mill, operated by J. R. Boswell.

—*Indiana, Fort Wayne. The United Knitting Mills, which are to build an addition to the plant, will increase the number of knitting machines to 120.

—Massachusetts, Boston. The control of the Echo Knitting Mills has passed from a Mr. Nugent to a Mr. Gorton, who is in the laundry business. We understand that the capacity of the plant is to be increased, and that the knitting machinery for ladies' goods will be thrown out and new machines put in for children's goods. Messrs Nugent and Gorton are now in Philadelphia looking up machinery.

—*Massachusetts, Lowell. The new yarn mill for the Shaw Stocking Co. has been completed and will soon be in operation.

—*Michigan, Grand Rapids. The Globe Knitting Works contemplate having their new mill, which will be 40x93 feet, four stories, brick, completed by June. About eighteen knitting machines will be installed in the new plant.

—New Hampshire, Franklin Falls. Walter Aiken's Sons' hosiery mill has been shut down, pending settlement with operatives on account of wages.

—New York, Amsterdam. A. V. Morris & Sons, knit goods manufacturers, have purchased the No. 2 mill of Warner, DeForest & Co., and will use it for storage purposes at present, although later it will be equipped for a cop yarn mill.

—New York, Oswego. The Mohawk Manufacturing Company has purchased M. J. Cummings' property on West First Street and will equip it with machinery, removed from the old mill, for manufacturing sweaters. Operations will be started in new annex as soon as possible. They will also erect a large storehouse.

—*New York, Utica. Operations have been started up in the new cop yarn mill recently completed for the Oneita Knitting Mills.

—*North Carolina, Raleigh. The new plant of the Melrose Knitting Mill has been started up. V. B. Moore is president and treasurer; J. S. Wynne, vice-president; J. W. Harden, secretary and F. W. Kohler, superintendent and manager of the mill. They manufacture men's underwear, equipment consisting of 15 body machines; two spoolers, 80 spindles; 20 sewing machines and one napper.

—Pennsylvania, Hamburg. A new addition is under construction for the Gotham Knitting Mills, S. D. Bausher, proprietor. New machinery will be installed, nearly doubling the present capacity of the plant.

—*Pennsylvania, Nazareth. The new full fashioned German machinery recently installed in the addition built to H. Kraemer's hosiery mill, has been put in operation. Plant now has capacity of about 500 dozen ladies' hosiery per day.

—Pennsylvania, Philadelphia. A one-story addition and other alterations are to be made to John Blood & Bro.'s bleach and dye house, Allegheny and Trenton Aves.

—*South Carolina, Jonesville. The new mill of the Jonesville Knitting Mills, which we previously reported would be in operation about August, will be equipped with a dyeplant. They will also build additional houses for the operatives.

—Tennessee, Chattanooga. The Ocoee Knitting Mill, manufacturing hose and half hose, will install several thousand dollars worth of new machinery in the plant.

—Tennessee, Knoxville. The Knoxville Knitting Mills Co. has purchased the entire hosiery plant of the George Manufacturing Co., Greensboro, which has discontinued operations.

Mills Starting Up.

—*Alabama, Talladega. Operations have been started in the Talladega Knitting Mill, recently completed.

—*Pennsylvania, Millheim. The Central Knitting Mills Co. has been organized to succeed to business of the Harrison Hosiery Company. Thomas West is general manager of the concern.

—*Pennsylvania, Spring City. The Century Knitting Company, capital stock of $15,000, Abraham D. Reiff, president and Geo. W. Reiff, treasurer, will start operations April 1st., making ladies' ribbed underwear. This mill will be equipped with 20 knitting machines.

Mills Shutting Down.

—New York, Cohoes. F. W. Kavanaugh Mfg. Co.'s plant has been shut down.

—New York, Oneida. The hosiery mill operated by Thomas Morgan has been shut down for a short time.

Silk.

New Mills.

—Connecticut, Willimantic. A new silk company, in which H. C. Murray, A. J. Bowen and W. B. Jordan are interested, will be organized with capital stock of $50,000, for manufacturing silk dress goods and linings. They contemplate installing 50 looms in building formerly occupied by the Natchaug Silk Company.

—New Jersey, Passaic. A new silk mill, for manufacturing umbrella goods and similar silks, will be established here by Fleitman & Co., of New York. Work will be started at once on erection of the plant, which will give employment to about 300 people.

—New Jersey, Paterson. The Holzman Silk Manufacturing Company has been organized with capital stock of $100,000 ($50,000 paid in), by S. L. Holzman, S. S. Holzman and H. S. Holzman. They will be located in the Adams mill and will manufacture broad silks and silk ribbons.

—New Jersey, Paterson. The Century Throwing Company has been incorporated with capital stock of $100,000 by Alexander McLane, Peter R. Rawson and Charles F. Isleib. Plant will be located in the Harmony Mill, where they will have equipment for silk throwing.

—*Michigan, Middleville. The Warren Featherbone Co. will start operations about April 1st, making cotton webbing and silk ribbons. The mill will have an equipment of about 40 looms, using steam and water power. A dye house will also be attached.

—*New York, Hornellsville. The Liberty Silk Company has started putting the looms in the mill, recently established here, in operation.

—*New Jersey, Paterson. The National Ribbon Co., capitalized at $150,000, with M. W. Dippel, president, and Geo. F. Kuett, treasurer and superintendent, will start operations April 1st, manufacturing silk ribbons. The mill will have an equipment of 165 looms, operated by steam.

—*Pennsylvania, Pottsville. The project of establishing a satin mill, captalized at $50,000, has been secured by the Board of Trade. The city raised $18,000 toward the enterprise.

—*Pennsylvania, York. Machinery is now being set up in the Diamond Silk Co.'s new mill. It will be some time before the plant can be put in full operation, but as soon as possible, they will start running on a small scale.

Enlargements and Improvements.

—*New Jersey, Paterson. We have been advised by the Kursheedt Manufacturing Co., New York, that the buildings of the Oldham Mills, which they purchased, will be utilized for one of their departments that has no connection whatever with weaving, dyeing nor printing and not for removal of plant as reported.

—*New Jersey, Paterson. The Post & Sheldon Silk Co. inform us that the 4,000 spindles in the McAlister Mill, recently purchased, will be moved and operated in connection with their weaving plant in the Hall Mill.

—New Jersey, Paterson. The Columbia Ribbon Company has purchased the Wicke Mill at Haledon and will remove to the new plant. They expect to start operation about May 1st, in new quarters.

—New York, Brooklyn. Operations have been discontinued for an indefinite time in the silk ribbon mill controlled by Adolph Pass, 171-187 Wallabout Street.

—New York, Oneonta. Additional looms are being installed in the Paragon Silk Mill.

—North Carolina, Wadesboro. Additional machinery is being installed in the Wadesboro Silk Mill, which, when completed, will double the capacity of the plant.

Mills Starting Up.

—*Pennsylvania, Pottsville. Operations have been resumed in the ribbon weaving department which has been idle for several years, of the Tilt Silk Mill.

Mills Shutting Down.

—Pennsylvania, Pottsville. The Schuylkill Haven Plush & Silk Mill has been shut down for an indefinite time.

Miscellaneous.

Enlargements and Improvements.

—Connecticut, East Hampton. Part of the silk machinery in the Summit Thread Company's mill on the top floor has been removed to the ground floor to make room for several new Cop machines to be set up and operated. This concern now makes mostly thread.

—*Massachusetts, Indian Orchard. The American Flax Company, recently removed here from Meredith, N. H., has started operations in the weave room and expect to have the other department in operation April 1st.

—*Massachusetts, Ludlow. The Ludlow Manufacturing Co. has completed erection of the new mill upon which we made a previous report. Work has been started on removing machinery into the new building.

—New York, New York. A six-story addition 50 by 100 feet is being built to the large cordage works of the Travers Bros. Co. New Machinery for making soft fibre goods will be installed.

—*Massachusetts, Williamstown. The Boston Finishing Company has nearly completed new addition and have already set up some of the machinery. The present dyehouse will be utilized for a calendering room; the new annex to be as a dye house.

—Pennsylvania, Philadelphia. James McCloskey, Margaret and Burmuda Sts., Frankford, contemplates erecting a new bleachery on Trenton Ave., which will greatly increase his facilities for business.

Mills Starting Up.

—Indiana, Peru. Operations will be resumed in the Peru Bagging Mills, which have been shut down over a year. Charles J. Krause will have charge of the plant here, and the branch mill at Louisville, will be under A. Lehanm's management.

Mills Shutting Down.

—New Jersey, Little Falls. The dye plant of Charavay & Bodvin is to be shut down and equipment removed to company's houses in New York.

Fires.

—Illinois, Lacon. The Ettrick Mills, J. W. Grieves & Son, proprietors, were totally destroyed by fire. The machinery and stock were a total loss. Damage is estimated at $50,000.

—New York, Rochester. The Leary Dyeing and Cleaning Works were completely destroyed by fire on the 1st inst.

—New York, Stillwater. R. & H. Newland's knitting mill was recently damaged by fire to the extent of about $25,000.

—Ohio, Dresden. The Buckeye Hosiery Mill, recently put in operation by Messrs.

McGovern & Prettyman, has been destroyed by fire. Loss is estimated at about $5000.

—Pennsylvania, Philadelphia. The dye house of the Schofield Mills, Main Street, Manayunk, was totally destroyed by fire. Loss is estimated at about $30,000.

—Pennsylvania, Philadelphia. The fancy braid mill operated by C. F. Belknap, 333 Chestnut St., was recently damaged by fire, which occurred in the building.

—Tennessee, Winchester. The Town Creek Woolen Mills have been totally destroyed by fire. The loss is estimated at about $12,000, with insurance of about $6,300. The plant will probably be rebuilt.

Failures and Suspensions.

—New Hampshire, Ashland. Robert H. Hart, successor to Hart, McArthur & Hart, operating the Squam Lake Mill, has made an assignment. William D. Veasey of Laconia is the assignee.

—Vermont, Winooski. Charles K. Cobb (Boston) and B. B. Smalley have been appointed receivers of the Burlington, Winooski and Colchester Mills, on petition of the corporation.

Facts and Gossip.

—Connecticut, Derby. The entire shirt department of the A. H. & C. B. Alling's mills has been shut down for an indefinite time.

—Connecticut, East Hartford. Samuel N. Brainerd, secretary of the Business Men's Association, is corresponding with Geo. E. Lackey, of New York, about establishing a plant for manufacturing lace curtains in this place or near vicinity.

—*Connecticut, Thompsonville. In confirming the report of the Hartford Carpet Company, we learn that R. P. Perkins is president; Geo. S. Squire, treasurer and O. M. Beach, secretary instead of names given in previous issue. Some of the departments have been shut down during alterations.

—Georgia, Athens. John R. White, C. D. Flanigen, W. T. Bryan, Charles H. Phinizy and John W. Welch are among those interested in the establishment of a $300,000 cotton mill here.

—Georgia, Centreville. Application has been made for a charter for the proposed cotton mill, for which $270,200 has already been subscribed.

—Georgia, Griffin. E. H. Spivy has severed his connection with the Griffin Knitting Mills. J. J. Mangham has succeeded to the position of secretary and treasurer.

—Georgia, Thomaston. The Thomaston Cotton Mills Co. has been re-organized with Jas. R. Atwater, president; G. W. T. Hanna, vice-president, and R. E. Hightower, secretary and treasurer.

—Illinois, Chicago. The Strauss Cahn Knitting Co., 258-260 E. Division Street, recently incorporated with capital stock of $50,000, succeeds to business of H. Strauss. Five additional machines have been installed, giving the plant a total of 35, making underwear. Levy Strauss is president and superintendent; M. A. Stern, vice-president, and E. B. Cahn, treasurer.

—*Kentucky, Covington. The Reliance Textile & Dye Works, which were practically destroyed by fire recently, will be rebuilt and in partial operation by March 15th.

—*Louisiana, Baton Rouge. It is now stated that the project of erecting a cotton mill seems an assured fact, as sufficient stock has been secured to make proceedings.

—Louisiana, New Orleans. The Maginnis Cotton Mills have discontinued manufacture of hosiery yarns. They will also reduce the output of cotton goods, since the depression in cotton market.

—Maryland, Ellicott City. The project of restarting the cotton mills at Gray's Factory has been revived. The property, which has passed through several hands, has now been purchased by Victor G. Bloede and James H. Gaitner.

—*Massachusetts, Canton Junction. The Canton Manufacturing & Bleaching Company's plant, recently placed on sale, was bid in by the attorney for the mortgagee, for $30,000 on the real estate and $250 for the personal property.

—Massachusetts, Fall River. The Globe Yarn Mills of the New England Cotton Yarn Co. will change over more machinery for manufacturing thread. For some time past the mills have been partly on this work.

—Massachusetts, Fall River. At a recent meeting of the stockholders of the Stafford Mills, Frederick E. Waterman, present treasurer of the Cornell Mills, was elected treasurer of the Stafford Mills.

—*Massachusetts, Lawrence. The Prospect and Globe Worsted Mills are offered at private sale by the trustees.

—*Massachusetts, Milford. Operations were not resumed on the 18th in the Magid-Hope Silk Manufacturing Co.'s plant as per previous reports. It is not definitely known when the difficulties will be adjusted and work started up. Mr. Magid is back from Europe.

—*Massachusetts, Fall River. Wm. Fish, Jr., is president and Wm. N. McLane, clerk and treasurer of the Crystal Spring Bleaching and Dyeing Co., recently re-organized. Mr. Fish is a New York cloth broker. Thayer Lincoln is on the board of directors.

—Massachusetts, Winchester. Robert, Lewis and Charles F. Bacon will continue operating the Bacon Mills, which property has recently been transferred to them by Charles N. Bacon, as Bacon Bros.

—*Mississippi, Hattiesburg. The project of erecting a cotton mill here is again being considered. A proposition has been made by a capitalist that he will invest $25,000 in enterprise if the citizens will secure $75,000.

—New Jersey, Bordentown. The carpet mill formerly at Freehold, is now in operation under management of Frank Geyer. Smyrna rugs and carpets are manufactured.

—*New Jersey, Paterson. Leonard Schrepfer is president and treasurer, Geo. T. Freeman agent and August A. Fischer superintendent and manager of the Caspars Silk Co., recently incorporated with capital stock of $25,000 to operate the mill of Peter Caspars, who has retired from business. They will manufacture silks and silk veilings.

—New Jersey, Paterson. The New Jersey Silk Company has transferred all its real estate and assets to E. Gerli & Co., of New York City, who have settled with the many creditors with 40 per cent. on the dollar. They will continue operating the plant under name of the New Jersey Silk Manufacturing Association.

—*New Jersey, Trenton. An effort is being made to organize a company to operate the Orleans and Trenton Worsted Mills, which are to be closed down in settlement of the estate of the late S. K. Wilson.

—New Jersey, Waldwick. The Post Silk Company has discontinued business.

—New Jersey, Weehawken. Application has been made that the Alliance Silk Company be declared insolvent and a receiver appointed. It is stated that the assets of the concern amount to about $38,000, with liabilities of $43,000.

—New York, Amsterdam. The knitting mill, formerly operated by Willard McElwain, deceased, is to be sold; the building at public auction and the equipment as desired to parties.

—New York Hudson. The Beaver Knitting Mill, John McCauley, proprietor, is to be sold under foreclosure.

—New York, Oswego. The Swits Conde Wool Company has been incorporated with capital stock of $25,000, by Swits Conde, Ben A. Hapgood and Swits C. Conde. It is stated that the large wool plant, located near the knitting mill, would be greatly enlarged.

—New York, Utica. M. J. Fisher is president and manager; J. A. Kernan, vice-president and C. J. Hughes, secretary of the Seal Back Underwear Co., recently started up. The present daily capacity of the mill, 100 dozen, will be steadily increased.

—New York, Waterford. The Himes Underwear Co. has moved the machinery from the small mill into the large one, where it has been put in operation.

—North Carolina, Charlotte. The mill formerly operated by O. A. Robbins & Co., will hereafter be known as the Charlotte Cordage Co., with J. L. Sexton, as president and general manager. Mr. Robbins has given up his interest in order to devote his time in dealing in cotton machinery.

—North Carolina, Goldsboro. A project is on foot for the erection of a plant to manufacture hosiery and underwear.

—North Carolina, Worthville. The Engleworth Mills, which have been shut down recently, have been purchased by the Worth Manufacturing Co., which will start at once making repairs and putting the plant in operation.

—*Ohio, Elyria. The Fay Stocking Co., which was burned down early in March, will probably be rebuilt, but this point will not fully be decided until insurance is adjusted.

—Ontario, Windsor. A. Trudeau and Notary Begin are interested in the establishment of a knitting mill here. It is reported that a building for same has already been secured.

—Oregon, Portland. The Oregon Flax Fibre Association, of which Mrs. H. L. Pittock is president, contemplates establishing a spinning mill here.

—*Pennsylvania, Alburtis. The Alburtis Silk Mill, recently destroyed by fire, will be rebuilt at once.

—Pennsylvania, Allentown. The Pioneer Silk Company's plant at Allentown, has been purchased by Celestina Piva, of Givernaud Bros., Union Hill, N. J. It is reported that he will organize a company to operate the mill. The Murray Mill at Paterson, was recently purchased by Pelgram & Meyer.

—*Pennsylvania, Dowington. The directors of the Downington Knitting Company have held a meeting regarding rebuilding the plant which was destroyed by fire. Will probably rebuild.

—*Pennsylvania, Kutztown. William and Hartley H. Seaton are operating the Kutztown Silk Throwing Mill.

—Pennsylvania, McKeesport. A local report states that Woodhouse, Bopp & Co., of New York, are considering propositions regarding establishment of silk mill making dress silks, and that they have written this town regarding inducements, etc.

—Pennsylvania, Philadelphia. C. F. Weierman, manufacturer of cotton hosiery, has removed his plant from Phillip Street, below Dauphin, to Mascher and Oxford Streets. Forty new machines have recently been added to the equipment.

—Pennsylvania, Philadelphia. John Watt's Sons, formerly on Hancock Street have leased space in the mill vacated by Joseph Taylor & Co., corner Howard Street and Montgomery Avenue. This concern manufactures carpets.

—Pennsylvania, Philadelphia. Isaac Lockhart, formerly at corner of Hancock and Somerset Streets, has leased quarters in the mill previously occupied by Joseph Taylor & Son, Howard Street and Montgomery Avenue.

—Pennsylvania, Schuylkill Haven. John A. Bowen has severed his connection with the firm of Bowen, Reed & Leininger, manufacturers of ribbed vests. The firm will continue operations under name of Reed & Leininger.

—Pennsylvania, Tamaqua. It is reported that Isaac Moosop of Moosop & Co., Wiconisco, wil establish a branch knitting mill here is a suitable site can be secured.

—Rhode Island, Providence. The mill, operated by Geo. E. Weeden, manufacturing candle wicking, was swept away by recent bursting of the dams.

—Rhode Island, Providence. The Allen Print Works is going out of business and the plant is offered for sale.

PERSONAL RECORD.

Cotton.

—C. E. Benson, who was for some time overseer of ring spinning, warping, spooling and dressing in Berkshire Mills Nos. 1, 2 and 3, Adams, Mass., has been made assistant to Supt. Z. D. Hall. He will be succeeded by A. G. Dockett, who has held a similar position in mill No. 4, and Fred Frary, who was secondhand under Mr. Dockett, will succeed him.

—John Chrystal, overseer of the weaving department of the Uncasville Mfg. Co., Versailles, Conn., has resigned, and, with his family, removed to New London, Conn. He will be not a little missed by the employes at the mill, who presented him with a gold chain and charm.

—Edgar Emerson has been engaged as superintendent of the Slatersville (R. I.) Finishing Co.

—C. F. Faulkner, of the Meridian, Miss., mills, who resigned a short time ago, has been made superintendent of the Tupelo Cotton MEls at Tupelo, Miss.

—David R. Harriman, manager of the F. W. Poe Manufacturing Co., of Greenville, S. C., has been appointed to take charge of the Buffalo Mills, near Union, S. C., one of the largest of the new cotton mills of the South, having 40,000 spindles and 1200 looms.

—Frank C. Haskell, of New Bedford, Mass., formerly connected with the Howland Mill Corporation, is to have the superintendency of a large cotton mill in Yazoo, Miss., and equip it with machinery.

—E. L. Jackson, lately with the Athens Manufacturing Co., Athens, Ga., is to become the manager of the Sutherland Cotton Mills of Augusta, Ga. He will succeed J. M. Head.

—Edward B. Jennings of Fall River, Mass., has tendered his resignation, to take effect June 1, to the New England Cotton Yarn Co. Mr. Jennings was agent and treasurer of the Globe Yarn Mills before the mills joined the yarn combination, and since then has been in charge of the Globe Yarn and Sanford Spinning Companies. It is rumored that he is to be at the head of a new corporation for manufacturing yarns.

—L. King is the new master mechanic and R. Steere engineer at the Globe Mill, Woonsocket, R. I., in place of T. L. Hadley.

—R. F. Karnes, formerly of Norwich, Conn., has recently engaged with the Indian Orchard Co., Indian Orchard, Mass., as boss spinner.

—George M. Lane has resigned as overseer of spinning at the Lawton Spinning Co., Woonsocket, R. I. John Ribchester, formerly employed in another department of the mill, has succeeded him.

—Harold Lawton, the founder and organizer of the Lawton Spinning Co., Woonsocket, R. I., who retired several months ago from that position and severed his connection with the company, has now resigned as superintendent of the Warwick Mills Co., of Centreville, of which he was also the organizer and superintendent since the work of construction was begun. Mr. Lawton has been superintendent of construction at Baltic, Conn., since soon after the Baltic Power Co.'s property came into the control of F. C. Sayles of Pawtucket, and now that the plant is about ready to start, he will assume the active management. The mills will operate 70,000 spindles and 1600 looms, and manufacture fine cotton goods.

—Harry McCusker, boss bleacher for the Aspinook Company, Jewett City, Conn., resigned April 1st, to go to Lewiston, Me., as superintendent of a large bleaching and dyeing plant. Mr. McCusker went to Jewett City when the bleachery was started, and has had charge since.

—Major Melville, formerly secondhand of the weave room of the Laurel Lake Mill, Fall River, Mass., has accepted a position as overseer at the Fall River Manufactory. His place is being filled by Benjamin Barton.

—G. T. Marsh, of Avondale, has assumed charge as superintendent of the Merrimack Mill, Huntsville, Ala., succeeding John Ranks.

—Frederick B. Macy, treasurer of the Soule Cotton Mill soon to be built at New Bedford, Mass., has severed his connection recently with the Wamsutta Mills of that city. Henry Howard, Jr., takes Mr. Macy's place as paymaster at the Wamsutta.

—E. J. Read has resigned as boss carder and spinner of the No. 1 mill of the Griswoldville Mfg. Co., Griswoldville, Mass.

—Paul Schultz, formerly overseer of the absorbent cotton department of J. H. Estes & Sons' twine mill, Fall River, Mass., has resigned, and removed with his family to Chicago, where he has a similar position.

—Samuel E. Thayer has resigned as master mechanic of the Blackstone Manufacturing Co., Blackstone, Mass., and is now at the No. 2 Electric Light Station, Woonsocket, R. I. Joseph Barnett, of the Saranac Mills has succeeded Mr. Thayer as master mechanic at Blackstone.

—George W. Towne, formerly superintendent of the Arlington Cotton Mills, has accepted a similar position with the Bibb Cotton Mills at Columbus, Ga.

—Fred E. Waterman, treasurer of the Cornell Mills, Fall River, Mass., succeeds the late F. W. Brightman as treasurer of the Stafford Mills, in the same city. Mr. Waterman, for the present, at least, will continue to act as treasurer of the Cornell Mills.

—James E. White, overseer of carding in the Tremont & Suffolk Mills, Lowell, Mass., has resigned. Mr. White was formerly with the Lawrence Mfg. Co., in the capacity of overseer of carding, for over twenty years, and afterwards in cotton mills in Montreal, Canada, and Burlington, Vt., returning to Lowell some four years ago, to the Tremont & Suffolk, where he has since been employed.

—Edward A. Warren, who has been connected with the Globe Yarn Mills, Fall River, Mass., for many years as bookkeeper and later as assistant to the treasurer, has resigned his position.

Woolen.

—Frank R. Bean, East Rochester, N. H., has been engaged to take charge of the finishing room of the Sutton Mill, North Andover, Mass.

—B. Bamforth, a well-known superintendent and carder in the line of shoddy manufacturing, at one time superintendent of the large plant of the F. Muhlhauser Company, Cleveland, O., is superintendent of the Basch & Greenfield Co.'s works, Newark, N. J.

—E. Barrows has been engaged as boss dresser for the Bay State Worsted Co., Worcester, Mass.

—James Clark is now with the Columbia Worsted Co., Wallingford, Pa., filling the position of machinist.

—George Dixon, recently employed by William Wood & Co., Philadelphia, as overseer of carding, has accepted a similar position with F. C. Huyck & Sons, Rensselaer, N. Y., manufacturers of paper-makers' felts.

—Joseph Daley has resigned as boss carder at the Faulkner Woolen Mills, Stafford Springs, Conn., to accept a similar position with Beebe, Webber & Co., Holyoke, Mass.

—J. W. Dawson, lately with the André Cardinal Silk Co., Lakeview, N. J., has been appointed superintendent of the Manhattan Silk Co., Reynoldsville, Pa.

—D. J. Dolan, boss spinner for Graham, Clark & Co., Adams, Mass., has resigned.

—William J. Driscoll, formerly of the French River Textile Co., Mechanicsville, Conn., is the new boss spinner at the Great Barrington Woolen Mills, Great Barrington, Mass. Prior to that he was boss spinner at Old Town, Me.

—E. L. England, Passaic, N. J., is now superintendent of the Butler Silk Mills, Butler, Pa., recently started up again.

—Frederick Edgeworth, an overseer of the Glenlyon Dye Works, Saylesville, R. I., has resigned in order to accept a position in Philadelphia, Pa. Just prior to his departure the help presented him with a gold watch chain and charm and a meerschaum pipe.

—Charles Grinley is now employed as boss spinner at the Passaic Woolen Co.'s mills, Passaic, N. J.

—James R. Garnett of Monson, Mass., has been engaged as boss finisher by the Pondicherry Woolen Co., Bridgton, Me.

—Albert Hess, of Auburn, N. Y., has been engaged as boss finisher for the Hanover Woolen Co., Hanover, Ill.

—Charles H. Hartley, West Fitchburg, has gone to Graniteville, Mass., to take charge of the combing and drawing room of Abbott & Co.

—George Kirkwood has returned to his home in Philadelphia. He recently resigned as overseer of spinning for W. J. Dickey & Sons, Oella, Md., in whose employ he had been for several years.

—R. B. Lewis, of Springfield, Mass., is now overseer of carding for the Crosby Manufacturing Co., East Glastonbury, Conn., having taken J. J. Grady's place.

—James Lapraik, for the past five years overseer of dyeing with the Robert Bleakie Co., Hyde Park, Mass., has accepted a position as overseer of dyeing with the Sutton Mfg. Co., North Andover, Mass.

—George Pettengill, of New Bedford, Mass., has been engaged as boss finisher for the West Swanzey Manufacturing Co., West Swanzey, N. H.

—Mr. Murray, overseer of carding at the Nasonville Woolen Co., Nasonville, R. I., has resigned, to accept a similar position with Joseph F. Fletcher at the Coronet Worsted Mills, Mapleville, R. I.

—James McCarthy has resigned as overseer of dressing, spooling and winding departments of the Kent Mfg. Co., Centreville, R. I.

—T. F. Moran, formerly of Wales, Mass., is the new boss finisher at the mill of Graham, Clark & Co., Maple Grove, Mass.

—Russell Manters is now with the Dews Woolen Co., North Dexter, Me., as boss dyer.

—Charles Pfliegel, of Terra Alta, W. Va., has recently been engaged as boss spinner for the Beaver Dam Woolen Mills, Beaver Dam, Wis.

—John P. Powers was recently engaged as boss dyer by Connor Bros., Holyoke, Mass., succeeding James Tobin. Mr. Powers had held this position before. Mr. Tobin has secured a position as boss dyer at the James J. Regan Mfg. Co., Rockville, Conn.

—Joseph Pinhston, formerly of Utica, N. Y., has for some time past been employed in the capacity of boss carder at the Dalton Woolen Mills, Dalton, Mass.

—Charles Pratt is now boss finisher for the Swift Mfg. Co., Enfield, N. H.

—Andrew Ross, of Holyoke, Mass., is the new boss dresser at the mill of Graham, Clark & Co., Maple Grove, Mass.

—Thomas H. Robinson, of Menasha, Wis., has recently been appointed superintendent of the Rochester Manufacturing Co., Rochester, Minn., succeeding C. Platt. This is a three set mill, exclusively on trouserings. Joseph Hamilton is overseer of spinning and carding, and George Kenyon is boss weaver.

—C. H. Robinson, formerly head wool sorter for the Burlington Woolen Mills, Winooski, Vt., has secured a position as wool buyer for a woolen mill in Malone, N. Y.

—D. W. Shea is now boss dresser at the Great Barrington Woolen Mill at Great Barrington, Mass.

—James Williams is now boss carder at the mill of the Riverdale Woolen Co., Northbridge, Mass.

—Edward H. Witt has succeeded Charles Broger as boss spinner at Connor Bros.' mill, Holyoke, Mass.

—William Wicks, who succeeded G. R. Rymarczick as superintendent of the No. 2 mill of Beebe, Webber & Co., Holyoke, Mass., was previously boss weaver at the No. 1 mill of Beebe, Webber & Co. for eight years.

—John Woodcock, for many years overseer of dyeing with the Slater Woolen Co., Webster, Mass., is now overseer of dyeing with the Dayville Woolen Co., Dayville, Conn.

—P. F. Whalen, of Webster, has recently assumed charge of the Hampden Worsted Mills, Hampden, Mass., as overseer of the weaving, spinning and winding rooms.

Knit.

—Charles Brodeur, formerly boss spinner for Connor Bros., Holyoke, Mass., has for some time past been acting in a like capacity for the Medlicott Co., Windsor Locks, Conn.

—John C. Calhoun, overseer of carding in one of the mills of the Victor Knitting Mills Co., Cohoes, N. Y., has resigned in order to accept a position at Passaic, N. J., with the Garfield Woolen Co.

—O. L. Clark, of Pittston, Pa., has been engaged as boss knitter in the latch needle department of the A. C. Staley Mfg. Co., South Bend, Ind.

—A. A. Ford, receiver of yarn at the Glenark Knitting Mill, Woonsocket, R. I., severed his connection with that concern recently.

—Thomas A. Galvin, of Troy, has been appointed superintendent of the W. H. Rowe Knitting Co.'s mills at Rockton, N. Y.

—William C. Hubbard, assistant superintendent, and Ernest T. Mathewson, assistant treasurer of the Glenark Knitting Co., Woonsocket, R. I., have resigned. The Colchis Mill, belonging to this company, is closed, and the dye house of the Glenark Mill is also closed.

—Samuel W. Holsapple has resigned his position as bookkeeper with the Union Knitting Co., Hudson, N. Y.

—John Karl, one of the proprietors and operators of the lately burned knitting factory at Mifflintown, Pa., has gone to Milton, Pa., to superintend a large factory at that place.

—George T. Nuttall of Philadelphia, Pa., is now filling the position of superintendent of the Blue Ridge Knitting Co., Hagerstown, Md.

—W. D. Neilson has severed his connection with the Sagamore Knitting Mill, and is engaged solely with the Knickerbocker Hosiery Mill, Mechanicsville, N. Y.

—Harry Snyder, who has been acting as traveling salesman for the H. P. Snyder Co., Little Falls, N. Y., has accepted a position as boss knitter at the mill of Yund, Kennedy & Yund, Amsterdam, N. Y.

—William H. Taylor, Utica, N. Y., has recently accepted the position of overseer of dyeing with the Eagle Knitting Co., Rockton, N. Y.

—Frank Vail, formerly boss knitter for the Johnstown Knitting Co., Johnstown, N. Y., has accepted a similar position at Elizabeth, N. J.

Deaths.

—Henry Hale Stevens, founder of the linen mills at Dudley, Mass., and a millionaire, died near Jacksonville, Fla., March 11th, 83 years old. He sold out his business interests in 1877, and during the winter had lived in Florida and in summer in Maine. He leaves a widow, two daughters and a son, the latter, Hon. Eben S. Stevens, of Quinebaug, Conn., a prominent manufacturer of woolen goods, and who has a branch factory at North Webster. His brother, Moses T. Stevens, is president of the Stevens Linen Mills.

—Warren N. Henderson, for many years treasurer of the Old Kentucky Woolen Mills, Louisville, Ky., died at his home, near O'Bannon, last month.

—William J. Bowes, manager of the Lawrence Felting Co.'s mill at Millville, Mass., died at his home in that city on March 18th. Mr. Bowes was born in Dublin, Ireland, in 1842, emigrating to the United States at the age of 14. He started in as an operative in the Pacific Cotton Mills, going from there to the finishing department of the Washington Mills, and later he became a finisher at the Methuen Woolen Co. He next entered the employ of the Lawrence Felting Co., being superintendent of the factory. He was advanced to the position of agent and eventually acquired an interest in the concern. Some five years after he became a member of the company, the Millville plant was built, and moving to that village in 1877, he was agent of the enterprise until 1893, when the Lawrence Felting Co. plant was sold to the United States Rubber Co., and he became its manager, which position he held at the time of his death. In business and social life, Mr. Bowes was very prominent. He was a very charitable and liberal man, and many poor people have cause to mourn his demise.

—Abraham F. Hervey's death occurred at his residence in Brookline, Mass., early last month. He was a native of Leicester, where he was born in 1823. He came to Boston in about the year 1850, soon after forming a connection with the firm of N. Boynton & Co., dealers in cotton duck, cordage, etc. For half a century he had been identified with that firm, for 40 years as a partner. Some ten years ago, Mr. Hervey retired from active business, but still retained a considerable financial interest in the affairs of the company, the firm name of which was changed in January of the current year to Wellington, Sears & Co.

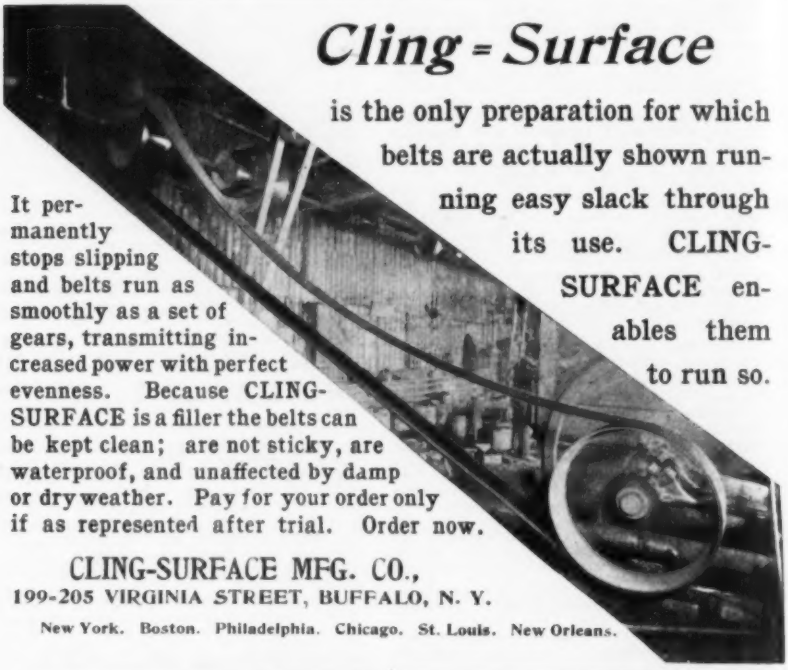
—C. L. Hardwick, a prominent and successful business man of Cleveland, Tenn., died in that city last month. He was 74 years of age, and was the founder of nearly all the manufacturing enterprises of the city. He established the Cleveland Woolen Mills, and was identified with many other enterprises. He was several times mayor, director in banks, and president of a bank at Dalton, Ga.

—Benjamin Eastwood, of the silk manufacturing firm of Eastwood & White, Paterson, N. J., dropped dead in the afternoon of March 14th, in front of his home. Mr. Eastwood was aged about 70 years, and when he left the house was apparently in the best of health. Heart disease is assigned as the cause of his death. He has been engaged in the manufacture of silk veilings and grenadines for a number of years.

—Albert Blood passed away in Lawrence, Mass., March 7, in his eighty-third year. He had been identified at different times with the Essex Co., the Lawrence Machine Shop, now the Everett Mills, and in 1864 built the Merrimac machine shops. He built the first 1000 looms used by the Everett Co. His wife and three children survive him.

—A. L. Floyd, of Boston, a member of Floyd Bros., manufacturers and importers of cotton and woolen goods, with headquarters in Boston, and New York office at 190 West Broadway, dropped dead last month, on his way to attend the funeral of his brother, Stephen F. Floyd, who was head of the New York house. Heart disease was the cause of his death.

—John R. Ashe, president and general manager of the York Cotton Mills, Yorkville, S. C., and a prominent citizen of this city, committed suicide late last month by jumping in a well on his place.



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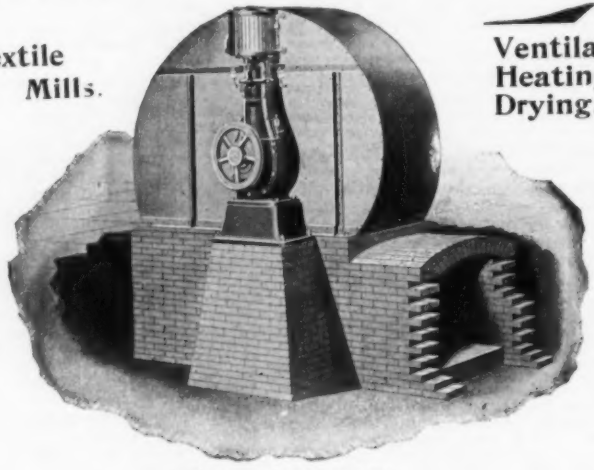

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BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.
Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.
Architects and Mill Engineers.
Ferguson, John W., Paterson, N. J.
Gray, Arthur F., Exchange Bldg., Boston.
Lockwood Greene & Co., 93 Federal St., Boston, Mass.
Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.
Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.
Asphalt Roofing.
Warren Bros. Co. 143 Federal St., Boston.
Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.
Woonsocket Machine & Press Co, Woonsocket, R. I.
Bailing Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.
Bandings.
See under Yarns.
Bands and Labels.
Docker-Foster Co., Phila., Pa.
Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Bargamin, G. & A. Co., Richmond, Va.
Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.
Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg, Co., Albany, N. Y.
Belt Hooks.
Bristol Co., Waterbury, Ct.
Bindings
See Tapes and Braids.
Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.
Block Cutting for Printing.
Smith & Meinken, 427 West 13th St., New York.
Blowers.
American Blower Co., Detroit, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant, B. F. Co., Boston, Mass.
Bobbins, Spools, Shuttles, Etc.
Murray, C. O., Nashua, N. H
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y.
Tebbets, E. L., & Co., Locke's Mill, Me.
Boilers.
See Steam Boilers.
Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.
Boxes, Paper.
See Paper Boxes.
Braiding Machinery.
New England Butt Co. Providence, R. I.
Thun & Janssen, Reading, Pa.
Braids.
See Tapes, Braids and Edgings.
Brass (Perforated.)
See under Perforated Metal.
Bridges.
American Bridge Co., The, New York.
Brushes.
Felton, S. A. & Son Co., Manchester, N. H.
Jacobus, A. G. Verona, N. J.
Warner, Wm. E. & Co., 136 Center St., New York.
Brushers
See Napping Machines.
Buildings (Steel).
American Bridge Co., The, New York.
Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
see also Dyeing, Bleaching Machinery etc.
Carbonizing Machinery.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts , Phila.
Smith, Jas. Woolen Machinery Co., Phila.
Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co . Philadelphia.
Leigh, Evan A, 35 Mason Building, Boston.
Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Smith, Jas. Woolen Machinery Co., Phila.
Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.
Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Ma.
Furbush, M. A. & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo C., 1783 Barker St., Phila., Pa
Smith, Jas. Woolen Machinery Co., Phila.
Cement "Dealers."
Warren Bros. Co , 143 Federal St., Boston.
Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.
Cling Surface.
Cling Surface Mfg. Co., Buffalo, N. Y.
Clocks.
Howard, E. Clock Co., Marlboro Building Boston.
Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., The, New Haven, Conn.
Hunter, James, Machine Co., North Adams, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.

Townsend, Thomas, 157 Orange St., Providence, R. I.

Commission Merchants (Dry Goods, Knit Goods).
Doane, Thomas H., 233 Monroe St., Chicago, Ill.
Southern Import & Commission Co., Greensboro, N. C.
Wagner, M. & Co., 213 Ninth St., Pittsburg Pa.

Compressors.
Worcester Warp Compressing Machine Co. Worcester, Mass.

Concrete.
Warren Bros. Co., 143 Federal St , Boston.

Conveying Machinery and Chains.
Jeffrey Manufacturing Co., Columbus, O.
Link Belt Machines Co., Chicago, Ill.

Cop Tubes.
See Paper Tubes.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.

Corrugated Iron Shutters.
American Bridge Co., New York.

Cotton Elevators.
Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machinery Co., Chicago Ill.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
American Loom Co., Readville, Mass.
Ashworth, Elijah, Fall River, Mass.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Barber & Coleman, Pemberton Sq., Boston.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co., Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowe, Stephen C., 186 Devonshire St., Boston, Agt. John Hetherington & Sons. Ltd.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.
Schofield, Geo. L., Philadelphia.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.
Worcester Warp Compressing Machine Co., Worcester, Mass.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cotton Waste.
Charles, W. B., Amsterdam, N. Y.

Credits.
National Mercantile Agency, New York and Boston.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Decoration Wash for Interiors.
Moore, Benj. & Co., Brooklyn, N. Y.

Designer.
Hendry, T., 406 W. 36th St., N. Y.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Hunter, Jas., Machine Co., No. Adams Mass.
Kenyon, D. R. & Son., Raritan, N. J.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.

Dyers, Bleachers and Finishers
American Yarn Printing Works, 134-136 North 22d St., Philadelphia.
Barnesville Mfg. Co., Barnesville, Ga.
Brophy's, T, Sons, Jasper St, Philadelphia
Conoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Fidelity Finishing Works, Philadelphia, Pa.
Firth & Foster Co, Kensington, Pa.
Franklin Bleaching & Finishing Works, Ltd., 70th St., and Haverford Ave., Phila.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Knause Bleachery, Hamburg, Pa.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Pond Lily Co., New Haven, Ct.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Antisdel, E. M., 12 Miller St., Utica, N. Y., (Knit Dryer.)
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
Dubois, A. N., 2170 Ledgely Ave., Philadelphia, Pa. (Black for Hosiery.)
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.

Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Philadelphia Textile Specialty Co, 500 North 12th St., Phila.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Smith, Jas. Woolen Machinery Co., Phila.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks.
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Corey, S. J, 273 Congress St, Boston
Dillon & Co, 20 Cedar St, New York.
Dubois, A. N., 2170 Ledgely Ave., Phila. Pa.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Fortner, L. B., 36 Strawberry St., Phila.
Geisenheimer & Co, 189 Front St, New York.
Holliday & Sons, Ltd., Read, 7 Platt St., New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 132 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J. & Co, 182-184 Front St, N. Y.
Molt Bros., Millbury, Mass. (Indigo Blue.)
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Schoellkopf Hartford & Hanna Co., Philadelphia, N. Y. and Boston.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y
Thayer, Ed. M., 106 Broad St., Boston, Mass.
Vila, H. S., 115 So 2nd St., Philadelphia, Pa.

Dynamos.
General Electric Co., 44 Broad St., New York
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Eastern Machinery Co, The, New Haven Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Electrical Construction.
General Electric Co., 44 Broad St., New York.

Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Electric Lighting.
General Electric Co., 44 Broad St., New York.

Electric Motors.
General Electric Co., 44 Broad St., New York.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St, Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Exhaust Heads.
Burt Manufacturing Co, Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Green Fuel Economizer Co., Matteawan, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Scaife, W. B. & Sons, Pittsburg, Pa.

Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N. Y
Thurston, A. G, & Son, Box 528, Fall River Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co, B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums
Eastern Machinery Co., New Haven, Conn.

Fuel Economizers.
Green Fuel Economizer Co., Matteawan, N. Y.

Fulling Mills for Woolen Goods.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas. Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

Garnetts.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Smith, Jas. Woolen Machinery Co., Phila.

Gas Engines.
Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Exhausters.
Sturtevant Co., B F., Boston.

Gears.
New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

Generating Sets.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Grate Bars.
U. S. Rocking Grate Bar Co., Elizabeth, N. J.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Labels.
Docker, Foster Co., Philadelphia, Pa.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

Hydro Extractors.
American Tool & Machine Co, Boston.
Rusden Machine Co., Warren, R. I.

Knit Goods Edgings, Trimmings, etc.
Cathcart, John & Co., 115 Franklin St., New York.
Charles, W, B., Amsterdam, N. Y.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, Allegheny Ave. and Emerald St., Phila.
Schneebeli, G. A. & Co., Nazareth, Penn.
Weimar Bros, 1817 East York St, Phila Pa.

Knit Goods Finishing Machines, Crochet, Etc.
Industrial Mfg. Co., Camden, N. J.

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Scott & Williams, 2079 E. Cumberland St, Phila Pa.
Willcox & Gibbs Sewing Mch. Co., New York.

Knitting Machine Cylinders.
Lindley, G. W., 5122 Wakefield St., Germantown, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.
American Knitting Machine Co., 6th and Arch St. Philadelphia, Pa.
Antisdel, E. M., 12 Miller St., Utica, N Y.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Phila.
Kutz, S. Jarius Machine Works, Reading, Pa.
Lamb Knitting Mach. Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue., Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co. Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.
Tompkins Bros., Troy, N. Y.

Knitting Needles and Supplies.
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co., 40 N. 7th St., Philadelphia.
Lamb Knitting Machine Mfg. Co., Chicopee Falls, Mass.
Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Knotter for Spoolers.
Barber & Coleman, 504 Sears Bldg., Boston.

Laboratory Outfits.
Bullock & Crenshaw, 528 Arch St. Phila, Pa

Looms.
American Loom Co., Readville, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts Philadelphia.
Furbush, M. A. & Son Co, Phila, Pa.
Howard, Geo. C., 1733 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A., 35 Mason Bldg., Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Smith, Jas. Woolen Machinery Co., Phila.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Pickers.
Loom Picker Co., Biddeford, Me.

Lubricators
Dixon, Jos., Crucible Co, Jersey City, N. J.

Lumber.
Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.
Gerry, George, & Son, Athol, Mass.

Machinery Dealers.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Schofield, Geo. L. Phila., Pa.
Taylor, James, 835 Arch St., Philadelphia.

Machinists' Tools.
Dodge Mfg Co., Mishawaka, Ind.
Whitton, The D. E. Co, New London, Conn.

Mails.
Walder, J, Paterson, N. J.

Mechanical Draft.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.
Fabric Measuring & Packaging Co., Postal Telegraph Bldg , New York.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
Philadelphia Textile Specialty Co., 500 North 12th St , Phila.
Rosden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bargamin, G. & A. Co., Richmond, Va.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Dixon Lubricating Saddle Co., Bristol, R.I.
Dodge Mfg. Co., Mishawak , Ind.
Douglas, R. D., Fall River, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Jeffrey Manufacturing Co., Columbus, O.
National Supply Co., Paterson, N. J.
Smith, Jas. Woolen Machinery Co., Phila.
Southern Bobbin Co., Greensboro, N. C.
Sweet & Doyle, Cohoes, N. Y
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Columbia Napping Machine Co. Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.

Noils (silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

Non-Shrinking Process for Wool.
Haigh, Frederic, 660 E. 23rd St., Paterson, N. J.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

Paint.
Moore, Benj. & Co, Brooklyn, N. Y.

Pantagraphs for Mill Engraving.
Johnson, C. A, & Co, 22 Dey St, New York.

Paper.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Boxes.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Box Machin·s.
Beck, Chas. Paper Co., Ltd., 607 Chestnut St., Phila.

Paper Tubes.
Douglas, R. D., Fall River, Mass.

Patent Solicitors.
Crosby & Gregory, 34 School St Boston, Mass.
Siggers, E. G., Washington D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

Pavers & Paving Materials.
Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.
Southern Bobbin Co., Greensboro, N. C.

Pipe Covering.
Kensby, R. A. 83 Warren St, New York.

Plumbers' supplies.
Bargamin, G. & A. Co., Richmond, Va.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery
Beggs, James & Co., 9 Dey St., New York.
Dodge Mfg. Co , Mishawaka, Ind
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co, Fall River, Mass
Lambeth Rope Corporation, New Bedford, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Phila.
Saginaw Manufacturing Co., Saginaw, Mich.
Smith, Jas. Woolen Machinery Co., Phila.

reparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.
Kitson Machine Co., Lowell, Mass.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.

Presses.
Boomer & Boschert Press Co., 338 West Water St., Syracuse, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Acme Pulley Covering Co., 1 West 103rd St., New York.
Vacuum Cement & Pulley Covering Co., 1493 Third Ave., New York.
Warren Mfg, Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Purifying & Filtration Plants.
Scaife, W B. & Sons, Pittsburg, Pa.

Raw Hide Gears.
New Process Raw Hide Co. Syracuse, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co., Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co , Mishawaka, Ind.
Lambeth Rope Corporation, New Bedford, Mass
Link Belt Mfg. Co., Chicago, Ill.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Scales
Sweet & Doyle, Cohoes, N. Y.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
French Textile School, Atlanta, Ga.
Georgia School of Technology, Atlanta, Ga.
Lee's College, Charlotte, N. C
New Bedford Textile School, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Selling Agents.
See Commission Merchants.

Separators.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.

Separaters, Oil and Steam.
Austin Separator Co., Detroit, Mich.

Sewing Machines and Supplies.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Industrial Mfg. Co., Camden, N. J.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Rusden Machine Co., Warren, R. I.
Union Button Sewing Mch. Co., 164 High St., Boston.
Willcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
See Power Transmission Machinery.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Arabol Mfg. Co., 155 William St., New York.
O. K. Soap Co. 968 Franklin St., Phila.
Potter, R. V. B., 231 Chestnut St., Phila.
Stein, Hirsch & Co, 165 Duane St, New York.

Sky Lights.
Drouve, The G. Co., Bridgeport, Ct.
Merchant & Co., Philadelphia, Pa.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.

Soaps.
India Alkali Works, Boston, Mass.
O. K. Soap Co., 968 Franklin St., Phila.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Ward & Undergrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I

Spinning Frames.
See Cotton Machinery

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Spool Cotton for Mfrs. Use.
Standard Thread Co., New York.
Warren, W. Thread Works, Westfield, Mass.

Spooler Knotter.
Barber & Coleman, 504 Sears Bldg., Boston.

Sprinklers
International Sprinkler Co., Philadelphia, Pa.

Stamps for Hosiery.
Smith & Meinken, New York.
Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co , Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Keasbey, Robert A., New York.

Steam Specialties.
Austin Separator Co., Detroit, Mich.
Butterworth, H. W. Sons Co., Philadelphia
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York
Sturtevant Co., B F., Boston.
U. S. Rocking Grate Bar Co., Elizabeth, N.J.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lewis, H. F. & Co., New Orleans, La.
Rusden Machine Co. Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Schneebeli, G. A. & Co., Nazareth, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co , Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Temples.
American Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc

Tenter Clips.
See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Textile Schools.
See Schools.

Thread Protectors.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.

Time Recorders.
Simplex Time Recorder Co., Gardner, Mass.

Tom Tom.
Frank's Wagon Works, 2731 N, 6th St., Philadelphia.

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.

Tower Clocks.
Howard, E. Clock Co., Marlboro Building, Boston.

Transmitter for Sewing Machine.
Allen & Overrocker, 2427 Mascher St., Phila

Trimmers.
Excelsior Sewing Machine Co , Philadelphia.

Turbines.
(See Water Wheels.)
Valves—Rubber.
Boston Belting Co., Boston, Mass.
Ventilating Apparatus.
Allington & Curtis Mfg. Co, Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve, The G. C., Bridgeport, Ct.
National Pancoast Ventilator Co., Philadelphia, Pa.
New England Ventilating & Heating Co, Providence. R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass
Wing, L. J. Mfg. Co., 95 Liberty St., N. Y.
Wall Whitening.
Moore, Benj. & Co, Brooklyn, N. Y.
Warp Stop Motions.
Am. Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.
Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R., & Son, Raritan, N. J.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren R. I.
Webendorfer & Walling, Paterson, N. J.
Watchman's Clocks.
Am. Watchman's Time Detector Co., Broadway, N. Y.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Howard, E. Clock Co., Marlboro Building, Boston.
Sanz & Co, 127 Duane St., New York.
Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.
Water Purifiers & Filters.
Scaife, W. B. & Sons, Pittsburg, Pa.
Water Wheels.
Alcott, T. C., & Son, Mt. Holly, N. J.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co. Springfield, O.
Water Wheel Governors.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.
Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.
Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.
Winders. (Hosiery.)
Foster Machine Co., Westfield, Mass.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street, Boston.
Wood Pulleys.
Beggs, James & Co., 9 Dey St., New York.
Dodge Mfg Co., Mishawaka, Ind.
Saginaw Manufacturing Co. Saginaw, Mich.
Wool Cleaning Compound.
India Alkali Works, Boston.
Wool Combing Machinery.
Leigh, Evan A. 35 Mason Bldg., Boston.
Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo & Son, Athol, Mass
Sargents', C. G., Sons, Graniteville, Mass.
Smith Jas. Woolen Machinery Co., Phila.
Woolen and Worsted Machinery.
Altemus, W. W, & Co, 2816 N. 4th St, Phila, Pa.
American Tool and Machine Co., Boston.
Arlington Mch Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks. Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia. Pa.
Lowe, Stephen C., 186 Devonshire St., Boston. Agt. John Hetherington & Sons, Ltd.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave , Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Schofield, Geo. I., Philadelphia.
Smith, Jas. Woolen Machinery Co , Phila.
Woonsocket Machine & Press Co Woonsocket, R. I.
Worcester Warp Compressing Machine Co. Worcester, Mass.
Wool Shoddies.
Slack, Wm. H. H., & Bro, Springfield, Vt.
Wool Washing, Preparing and Drying Machinery.
Hunter, Jas. Machine Co., No. Adams, Mass.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Phila.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G. Sons, Graniteville, Mass
Smith, Jas. Woolen Machinery Co., Phila.

YARNS, THREADS, ETC.

Banding.

Lambeth Rope Corp., New Bedford, Mass.
Moore, C. & Co, 12 S. 5th St, Phila, Pa
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Argo Mills Co., 216 Chestnut St., Phila, Pa.
Barnesville, Mfg. Co., Barnesville Ga.
Buckingham & Paulson, 83 Leonard St., New York.
Catlin & Co, New York and Boston.
Charles, W. B , Amsterdam, N. Y.
Colchester Mills, 346 Broadway, New York.
Dana Warp Mills, Westbrook. Me.
Dexter Yarn Co., Pawtucket, R. I.
Dodds, J. S., 517 Wool Exchange, New York.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Morgan, E. A. 54 Franklin St., N. Y.
New England Cotton Yarn Co , New Bedford, Mass.
Orswell Mills, Fitchburg, Mass
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax. Hemp. Jute and Ramie.

Fawcett, Hughes, 115 Franklin St., N. Y
Eichmann & Sternberg, 530 Broadway, N. Y.
Morgan, E. A., 54 Franklin St., N. Y.

ARGO MILLS COMPANY,

HIGH GRADE KNITTING YARNS.

Carded, Combed, Egyptian, American.

Cops, Skein, Cones, Warps,

216 Chestnut St., Philadelphia, Pa.

Gassed Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, New York.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
New England Cotton Yarn Co , New Bedford, Mass.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twine.

Cranston Worsted Mills, Bristol, R. I.
Eichmann & Sternberg, 530 Broadway, N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Morgan, E. A., 54 Franklin St., N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Argo Mills Co., 216 Chestnut St., Phila., Pa.
Barnesville Mfg Co., Barnesville, Ga.
Boyer, B. F, & Co, Camden, N. J.
Colchester Mills, 346 Broadway, New York.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co., New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mercerized Yarns.

Dodds, J. S., 517 Wool Exchange, New York.
Eichmann & Sternberg, 530 Broadway, N. Y.
Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co., Philadelphia.
Montgomery, J. R. & Co., Windsor Locks, Conn.
Morgan, E. A., 54 Franklin St., N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Goff, D. & Sons, Pawtucket, R. I
Skerry, A. T, & Co., 47 Leonard St., N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, 530 Broadway, New York.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard, St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence. R. I.
Eichmann & Sternberg, 530 Broadway, New York.
Magid Hope Silk Mfg. Co., Milford, Mass.
Mason, Dan'l, Voorhis Mill, Paterson, N. J.
Ryle. Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket. R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, Camden, N. J.
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Pocasset Worsted Co., Thornton, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Alphabetical Index to Advertisements.

page

Acme Pulley Covering Co. . . . 784
Alcott, T. C. & Son 806
Alexander Bros., ... 639
Allegheny Worsted Mills, ... 768
Allen & Overrocker 805
Allington & Curtis . Outside Back Cover
Altemus, W. W. & Son, ... 626
American Blower Co , ... 807
American Bridge Co., ... 632
American Correspondence School of Textiles, ... 787
American Cotton Yarn Exchange, . . —
American Knitting Machine Co., . . 796
American Loom Co., The, ... 622
American Mfg. Co., ... 646
American Moistening Co. 766
American Napping Machine Co., . . 791
American Perforated Metal Co. . . 773
American Supply Co., ... 626
American Tool and Machine Company 785
Am. Watchman's Time Detector Co. . 640
American Yarn Printing Works . . 802
Anchor Color Mfg. Co, ... 781
Antisdel, E. M. 801
Arabol Mfg. Co., The 640
Ardrey, S. B, & Sons, ... 802
Argo Mills Co., ... 750
Arlington Mach. Works (Arthur Birch), 784
Ashworth, Elijah, ... 699
Atlas Foundry Mch. Co., ... 633
Atherton Machine Co., The A. T. . . 622
Atteaux, F. E. & Co. 778
Austin Separator Co. 636
Babcock & Wilcox Co., The, . . . 637
Bailey, Frank 784
Bamford & Smith, ... 792
Barber & Coleman 624
Bargamin Co., G. & A. 629
Barnesville Mfg. Co. 764
Beattie, Wm. & Son 804
Beck, Chas., Paper Co., Ltd. . . . 760
Beckley, A. J. & Co. 773
Beggs, Jas. & Co. 760
Berlin Aniline Works, ... 780
Berry, A. Hun, ... 783
Birch Bros. 620-784
Bischoff, C., & Co., ... 781
Boomer & Boschert Press Co. . . . 762
Booth, Benj. Co. 629
Bosson & Lane, ... 782
Boston Belting Co., ... 634
Boyer, B. F, & Co, ... 768
Branson Machine Co, ... 796
Breedon Sons, Wm., ... 803
Bristol Co., The . Outside Back Cover.
Brophy's, T, Sons 772
Brown, C. H, & Co, Outside Back Cover.
Brown, W. H, ... 636
Buckingham, Paulson & Co., . . . 769
Buckley's Benj., Son, ... 804
Buffalo Forge Co. 742
Burt Mfg. Co. 754
Butterworth H. W. & Sons Co., . . 689
Caldwell, W. E. Co. 786
Campbell & Clute, ... 802
Campion, Richard, ... 771
Cathcart, John & Co. 767
Catlin & Co, ... 769
Charles, William B. 772
Cheney Bros, ... 742
Cling Surface Co. . . . . —
Cohoes Foundry & Machine Co., . . 789
Colchester Mills, ... 791
Columbia Napping Machine Co. . . 802
Cooper, Chas, ... 781
Corey, S. J., ... 803
Corey, Wm., Co., ... 639
Crabb, Wm, & Co, ... 802
Crane Mfg. Co., ... 768
Cranston Worsted Mills, ... —
Crawford, J. J. & Son., ... 768
Croft, Howland, Sons & Co, . . . 645
Crosby & Gregory, ... 792
Curtis & Marble Machine Co., . . . 786
Cypress Lumber Co, ... 766
Dana Warp Mills 766
Davidson & Brooke 774
Delaunty Dyeing Mch. Co. . . . 784
Denny, R. B. 752
Dexter Yarn Co., ... 769
Dillon & Co, ... 781
Dixon, Jos., Crucible Co., . . . 806
Dixon Lubricating Saddle Co. . . 626
Doane, Thomas H. 759
Docker-Foster Co. 799
Dodge Manufacturing Co. 625
Dodge Needle Co. 798
Dodds, J. S. 769
Douglas, R. D. 627
Drouve Co., The G. 640
Draper Company 611
Dubois, A. N. 761
Duncan & Baillie, ... 774
Eastern Machinery Co. 806
Easton-Burnham Co., ... 762
Eco Magneto Clock Co, ... 640
Eddy & Street, ... 768
Eichmann & Sternberg, ... 769
Elliot & Hall, ... 628
Excelsior Knitting Machine Mfg. Co, . 798
Excelsior Sewing Machine Co., . . 804
Fabric Measuring and Packaging Co. . 630
Fairmount Machine Co, ... 622
Farbenfabriken of Elberfeld Company, 777
Fawcett, Hughes, ... 767
Felton, S. A. & Son Co., ... 626
Ferguson, John W., Outside Back Cover
Fidelity Finishing Works 775
Firth & Foster Co 575
Fleming & Chapin 804
Fortner, L. B. 761
Foster Machine Co. 619
Franklin Bleaching & Finishing Works 775
Frank's Wagon Works . . . . . —
Friedberger Mfg. Co. 795
Fuel Economizer Co., The 637
Furbush, M. A. & Son Machine Co. . 646
Geisenheimer & Co. Outside Back Cover.
General Electric Co., ... 637
Georgia School of Technology . . . 787
Gerry, Geo. & Son, ... —
Goff, D. & Sons 762
Goulds Mfg. Co, ... —
Granger Foundry & Machine Co., Inside Front Cover.
Grant Yarn Co., ... 767
Gray, Arthur F. 627
Greene & Daniels Mfg. Co., . . . 764
Greenwood, R., & Bault, ... 774
Haedrich E. M. 783
Haigh, Frederic., ... 633
Hardy Machine Co., ... 792
Hart, Chas. . . . . —
Hartford Steam Boiler Inspection & Insurance Co., ... 773
Hendry, T. 638
Hepner & Horwitz, ... 792
Hill, James Mfg Co., ... 635
Home Bleach & Dye Works, ... 774
Hooven, Owens & Rentschler Co, . . 634
Howard, E. Clock Co. 640
Howard, Geo. C., ... 634-792
Howard & Bullough Am. Machine Co.. . 613
Hunter, Jas, Machine Co, ... 788
Hunt, Rodney, Machine Co, ... 789
Hyde, Edward S., ... 759
India Alkali Works, ... 773
Indian Orchard Co. 764
Industrial Manufacturing Co., . . . 805
International Sprinkler Co., . . . 638
Ives, Loyal T. 803
Jacobus, Austin G. 628
Janney, O. S., & Co., ... 782
Jefferson, Edw, & Bro., ... 754
Jeffrey Mfg. Co. 629

	page
Jenckes, E., Mfg. Co.,	769-793
Jenkins Bros., Outside Back Cover.	
Johnson, Chas. A., & Co.,	774
Johnson, Wm. G. & Co.	778
Jones, J. Howell	781
Jones, Lewis	800
Keasbey, Robert A. Outside Back Cover.	
Keller, John J., & Co.,	779
Kennedy, Thos	800
Kenyon, D. R. & Son,	790
Keystone Knitting Machine Mfg. Co.	803
Kilburn, Lincoln & Co.,	627
Kitson Machine Co.	6 5
Klipstein, A., & Co., Outside Back Cover.	782
Klauder-Weldon Dyeing Machine Co.	791
Knapp, C. H.	638
Knause Bleachery	761
Koechl, Victor, & Co,	776
Krout & Fite Mfg. Co.,	804
Kuttroff, Pickhardt & Co.	641
Kutz, S. Jarius	761
Lamb Knitting Machine Co.	801
Lambeth Rope Co., Outside Back Cover.	
Laminar Fibre Co.,	—
Lea Electric Mfg. Co.,	639
Lee's College	615
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	page
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The people of Minden and Webster Parish are organizing a cotton factory at Minden, and want to correspond with a man of marked experience and ability, with some money, who would become interested with them in, and superintend the plant.

No man need apply who will not furnish the best references. Address with particulars, **F. H. Drake and Thos. Crichton, Minden, La.**

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A man thoroughly familiar with the finishing of Beetled Dress Linings or Percalines. Please state references and wages expected. Address "J," care of Textile World.

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In Rochester, N. H., noted for its excellent railway facilities, brick mill 110 x 50, 4 stories; three story annex, 25x35. Two 48-inch upright Hunt wheels of 1 to pattern, rated 62 H. P. each; one used for operating the mill and other for fire pump; combined or separate as desired.

Water gives about 50 horse power the year around. Two thirds of time gives full capacity of wheels. Supplementary 100 horse power Brown Automatic Steam Engine, practically new, sufficient to run the whole of the machinery. Main belts and 700 feet of shafting.

The mill is equipped with woolen machinery, some of which is modern. Half of mill provided with automatic sprinkling system; 2 hydrants in yard. With very few changes can be rendered acceptable to the Mill Mutual Insurance Companies.

I will lease this factory for a term of years, to right parties, at a figure below the cost of operating a steam power plant, and will guarantee to get them exempt from taxation for a term of ten years.

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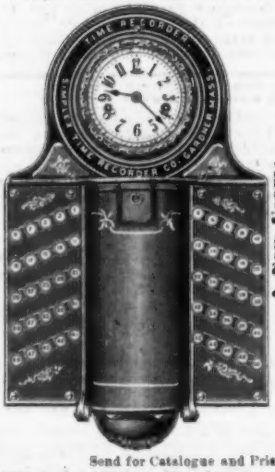

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SITUATIONS WANTED.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD or inquiries concerning them may be addressed directly to "Information Department TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

A member of the firm is in charge of this department, and gives personal attention to each case.

WOOLEN SUPERINTENDENTS.

1829 **Woolen Supt.**, or asst. or dyer. Age 35; American; married. Has worked on kerseys, coverts, worsteds, cassimeres, etc. Is familiar with Davis & Furber jackets and mules, and Crompton & Knowles.

1840 **Supt. Woolen Mill**, designer or overseer of weaving. Age 32; American; married. Has worked on kerseys, meltons, uniform cloth, indigo blue, doeskins, fancy cassimeres, cloakings, overcoatings, venetians, and broadcloth. Excellent references.

1841 **Superintendent.** Was eight years in every department and acted as assistant in England. Wants to get a start in this country. Would take position as assistant superintendent, designer, or assistant designer. Has had experience on high grades of plain and fancy woolens and worsteds, as well as army kerseys and cotton worsteds.

1823 **Supt., Designer or Overseer** of weaving. Age 42; English; married. Large experience on fancy cassimeres, cloakings, beavers, meltons, plaid backs, golf caps, rugs, union worsted suitings and government work, flannels, face-finished goods, and can make them up from the yarn. Is familiar with Crompton & Knowles and English looms.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1575 **Assistant Supt. Woolen.** A graduate of the Philadelphia Textile School (highest standing), and has had more than 7 years' experience in the various departments of a Massachusetts mill. Wants to get a start where there is fair chance of advancement. Age 28, single.

1768 **Supt. and Designer** in a worsted or woolen mill. Prefers worsted mill. Now employed as designer and assistant supt., but is competent to take charge of a mill. Is familiar with all makes of machinery, and has manufactured nearly all classes of goods. Excellent references.

1856 **Supt. Worsted Yarn Mill.** 35 years old; Scotch; married. All kinds of worsted yarns in the gray mixtures and mottled, especially fine numbers. Bradford system.

1537 **Woolen Superintendent, Designer or Weaver.** Has worked on all classes of woolens, worsteds, cotton worsteds, fancy cassimeres, etc., and is acquainted with all Eastern makes of machinery. American. Age 34; married.

COTTON SUPERINTENDENTS.

1877 **Agent or Treasurer.** Good references. Recently assistant manager of a large mill. Fully competent.

1806 **I would like** to correspond with some president or manager of some cotton mill now running or any new mill now being constructed, who would like to engage a competent superintendent. I want to engage with a cloth mill of any number of spindles not exceeding 10,000. My price is $1,000 a year, with no loss of time. I am a practical manufacturer, of long experience as overseer and superintendent. I am a good manager, full of push and energy, and I have a good record as a hustler for big productions and making money for my employers. Strictly temperate.

1689 **Supt. or Assistant Supt.** Age 37; American; married. Large experience as overseer and first-class references. At present employed as overseer, but is capable of filling a superintendent's position. Worked on prints, twills, sheetings, cambric and fancies.

1853 **Supt. Cotton Mill**, or would take an overseer's position in a large mill North for the present. Has been assistant superintendent for past year, previous to which he was overseer of carding for nine years, and before that was overseer of carding and spinning in the South. First-class references. Can take position at once. Colored and white goods. English and American machinery.

1453 **Superintendent** desires position in a cotton mill. Age 28; married; American. Has worked on prints, fine sateens, sheetings, ginghams duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. Refers to past employers.

1806 **Supt. of a Cotton Weaving Mill**, colored or white, 5,000 to 10,000 spindles; or overseer of weaving in a cotton mill, on any kind of work and any size mill, white or colored. Will go East, West, North or South, Canada or Mexico. Has had good and long experience. A married man; 40 years old, strictly temperate. Can give references as to ability and character.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills

WOOLEN CARDERS.

1798 **Boss Carder,** or carder and spinner. Age 40; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannels, blankets, kerseys meltons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1842 **Carder and Spinner in a Small Mill,** or spinner in a large mill. Has worked on wool, cotton, dress goods, cheviots, shoe cloth, hosiery yarn, and wool, cotton and shoddy mixes. Is familiar with Davis & Furber, Johnson & Bassett, Smith & Furbush machinery.

1701 **Boss Carder.** Age 39; English; married. Has had large experience as boss carder in Canadian mills, also held positions in England before coming to this country. Has worked on all kinds of wool, cotton waste, mungo and shoddy mixes, cassimeres, dress goods, knit goods, blankets. Can take position at once. Excellent references.

1827 **Overseer of Woolen Card** Room. Has worked on blankets, robes, friezes, cheviots, kerseys, flannels, knit goods, cassimeres, hair lines and unions. Age 34; American; married. Wants not less than $3.00 per day.

1801 **Overseer of Carding.** Age 27; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts. Is familiar with all kinds of American machinery. Wants $3.00 per day.

COTTON CARDERS.

1736 **Overseer Cotton Card Room** and Combing. Age 39; married. Has been overseer for past nine years. In last position seven years Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

1751 **Carder and Spinner.** Can give first-class references as to character and ability. Has had twenty-one years' experience as overseer on both American and Englgh systems of carding. An American; 45 years old. Has worked on fine and coarse, also colored cotton.

1027 **Overseer of Cotton Carding.** Age 32; American; married. Has worked on coarse and fine yarn, from 10's to 170's, carded and combed, and is familiar with English and American makes of machinery. Will not work for less than $3 50 per day. Excellent references.

1782 **Overseer Cotton Carding.** Age 25; single. Fine carded and combed cotton yarns. Is familiar with all makes of machinery. Wants $3.50 per day.

1759 **Overseer of Carding Room.** Age 26. Has worked on fine and coarse yarn, and understands all makes of machinery in carding Good manager of help by speaking different languages. At present overseer in a small mill. Excellent reference as to character and ability. Wants from $3.00 to $3.50 per day.

WOOLEN SPINNERS.

1691 **Boss Spinner** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 25; English; single. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1862 **Overseer of Spinning.** Is used to Johnson & Bassett, Davis & Furber and Campbell & Clute machines. Has had 18 years' experience as an overseer. Is a handy man, and can give good references. Wool, cotton and mixtures.

1834 **Overseer of Spinning.** Experience covers eight years as second-hand and fixer and eleven years as overseer. Has handled nearly all kinds of goods. Is an expert fixer. Worked on Davis & Furber mules. Age 38; American; married.

1820 **Overseer in Woolen Spinning.** Has worked on ladies' dress goods, cassimeres, cheviots, beavers, all wool, and wool and cotton, and wool, cotton and shoddy mixes, from 1 run to 9. Davis & Furber Johnson & Bassett and Platt mules and jacks Refers to past employers. Wants $2.50 per day.

COTTON SPINNERS.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1753 **Overseer of Spinning.** Wants position in the South. Has worked on prints, flannels, sheets, colored double nap flannel dress goods. Age 27; American; married. Excellent references from past employers.

1822 **Overseer of Cotton Mule** spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York States. Has worked on colored hosiery yarn and filling.

1861 **Overseer of Ring Spinning,** spooling, warping and twisting, reeling and winding, etc., in a room not over 10,000 spindles. Age 27; French; married.

1779 **Boss Mule Spinner.** Now employed in South, but wants to change on account of climate. Has had 15 years' experience as a cotton spinner, working up to overseer from back boy. Is well acquainted with all makes of English mules, also latest Mason mules, and is familiar with the working of all drafts and twists. Married; 30 years old, and temperate.

1739 **Overseer of Ring Spinning** Spooling and Warping. Age 45; married. Wants to return to New England. A thoroughly practical spinner, and can furnish references from any mill where he has worked, and is a first class manager of help. Wants no tless than $4.00 per day.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1857 **Overseer or Asst. Supt.** Age 43; German; married. Worked on carpets, Smyrna rugs, chenille, silk ribbons, woolen dress goods, suspenders, plushes and velvets of various kinds, and cotton woven body hammocks. Wishes to change on account of climate.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1607 **Worsted Weaver or Fixer.** Will accept fixing job at $2.25 a day. Experience covers worsted coatings, cassimeres, dress goods and jacquard work. Familiar with Crompton and English looms.

1805 **Boss Weaver.** Has worked on fancy dress goods, cashmeres, ginghams, fancy worsteds, coatings, lenos and Jacquards. Has also some knowledge of designing. English; age 36.

COTTON WEAVERS.

1783 **Secondhand or Overseer** of cotton weaving, or assistant designer. Age 25; American; single. Just completing two year course in both designing and weaving. Is a practical loom fixer of three years' experience.

1843 **Boss Weaver,** or secondhand, or would take fixing job. Age 42; American; married. Worked on Davis & Furber cotton and woolen looms, Lewiston cotton looms, Crompton looms, and Knowles cam looms. Plain dress goods, heavy cloakings and men's suitings in different grades and checks and stripes.

1828 **Overseer of Weaving.** Has worked on denims, domets, tickings, jeans, ducks, shirtings, dimities, lawns and all kinds of twills, cottons, ginghams, sateens, and fine cambrics. Is familiar with Crompton, Whitin, Mason, Lowell, Draper, Pattee, English, Bridesburg and Knowles looms. Age 35; American; married. Several years' experience as overseer.

1855 **Overseer of Cotton Weaving.** 32 years old; married, and strictly temperate. Worked in present place for a number of years. Started as a weaver, been a fixer and is now overseer's clerk. Used to fancy checks, plaids, lenos and dimities. Wants a more responsible position.

1863 **Overseer of Cotton Weaving.** Age 34; English; married. Worked on lenos, lappets, sateens. Worked in New England mills for past 14 or 15 years as loom fixer, third hand and secondhand.

KNITTERS.

1833 **Wanted.** A position as superintendent of woolen mill manufacturing wool, or wool mixed hosiery or underwear. Is a practical man, understands carbonizing and mixing of stock, etc. References furnished.

1876 **Boss Knitter** on latch needle machines. First class references as to character and ability. Age 27; married; American

1875 **Manager or Supt.** knitting mill Ribbed goods preferred. Full lines in men's, ladies' and children's underwear, cotton and wool mixtures, in both flat and ribbed goods. Wants to locate in the South.

1749 **Boss Knitter or Fixer** wishes position. Eight years' experience on knitting machinery. Experienced on Standard, Mayo and Hepworth machines. Will accept position in any state.

1812 **Boss Knitter** on latch needles, or sewing machine fixer. Age 35; American; married. Has had twelve years' experience, and can handle any kind of latch needles. Excellent references as to character and ability.

1776 **Boss Knitter.** Had constant experience in the knitting business for the past twenty years. Can handle any kind of goods made on a circular spring needle knitting machine. Age 38; American; married. Excellent references.

1824 **Boss Knitter or Fixer** on ribbed underwear. Has worked on fancies, double knees and tops and plain work. Is familiar with Brinton & Denny, McMichael & Wildman, Huse and Pepper machinery. Will work for $2.50 or more, according to position.

DYERS.

1626 **Dyer and Finisher,** with experience on plushes, dress goods, mohair and worsted genapped yarns, cotton and woolen yarns, raw stock. At present employed, but will consider position paying $3 a day.

1821 **Boss Dyer.** Age 35; American; married. Worked in hosiery dyehouse for seven years as boss dyer. Has had experience on fast black, lisle finish and extract work.

1809 **Boss Dyer.** Age 33; American. Wants $3.50 per day or more. Wants to change on account of locality. Has worked on fancy cotton yarns, mohair novelty yarns, worsted yarns, raw cotton, raw wool, piece dyes on flannel, mixed cotton and wool and all wool, kerseys and beavers and beavers with cotton warp.

1846 **Boss Dyer** or bleacher. Age 28; English; single. Has worked on mostly all kinds of dyed and bleached goods. Wants to change as place he is in does not agree with him.

1850 **Head Dyer** on cotton yarn or cloth, or would take a position as chemist, sample dyer in an aniline manufacturing company, or dyestuff salesman. English; 26 years old; married. Strictly temperate, and can furnish references.

1871 **Fast Black Dyer** on cotton hosiery. Knows a new and secret process of dyeing an aniline fast black, with or without the lisle finish. Guaranteed fast and sanitary.

FINISHERS.

1792 **Boss Finisher.** with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

1506 **Overseer of Worsted or Woolen Finishing.** Has had full charge of burling, mending, wet and dry finishing and shipping. Has worked on fancy dress goods, cheviots, men's suitings, flannels, thibets and cloakings. Is familiar with English and American machinery. Refers to past employers.

1716 **Finisher.** Age 29; English; married. Has worked as wet finisher, shearer, gigger, second-hand and overseer. Prefers a mill making cassimeres, worsteds, dress goods and face finished goods. A high grade of goods. Is familiar with all kinds of American and English finishing machinery, and can keep same in the best of repairs. Prefers Eastern States. Can take position at one week's notice. Best of references.

1870 **Wanted,** position as cotton finisher. American; age 48; married. Thirteen years' experience in finishing interlinings, shirtings, sheetings and cambrics, in one of the oldest and largest bleacheries in the country. Good manager of help. Can furnish reference.

1804 **Overseer of Finishing.** Wants to change on account of town he is in. Is familiar with all kinds of woolen and worsted machinery, and has worked on kerseys, cassimeres, carriage cloth, worsteds, dress goods, shawls, etc. Age 35; American; married. Wants $3.00 per day. Excellent references from past employers.

DESIGNERS.

1789 **Designer,** or assistant supt. and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1445 **Designer or Finisher,** or will take position as supt. of a small mill. German; Protestant; age 36; married. Has worked in several New England mills, and refers to them. Graduate of the Werden Textile School, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1837 **Designer** in small mill, or assistant in large mill. Age 25; Scotch; single. Has worked on fancy cassimeres, plaid backs, coverts, unions, worsted trowserings and shirtings. Fair knowledge of Jacquard designing. Johnson & Bassett mules, Davis & Furber dresser, and Knowles looms. Is willing to work for moderate salary, with chance of promotion.

1838 **Designer,** assistant supt., assistant designer, overseer of weaving, secondhand large weave room, loom fixer, boss spooler, dresser, or mender Age 48; American; single. Worked on worsteds, cassimeres, dress goods, blankets, chinchillas, cloakings, etc. All patterns of Crompton & Knowles looms, Davis & Furber spooling, dressing and weaving machinery, and Worcester warp compressor.

MISCELLANEOUS.

1810 **Dresser Tender.** Age 23; German, single. Is familiar with Davis & Furber and Cleveland dressers. Will not change for less than 20 cts. per hour.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1835 **Beamer, Twister,** also understands drawing in and splitting. Age 27; American. Has worked on ginghams, dress goods, shirtings and cotton worsted.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1851 **Machinist in Woolen Mill.** Can repair looms, cards, mules, etc., of every description, also worsted machinery. Understands forging tools and has fair knowledge of electricity. Ten years experience in some of the best mills in New England.

1845 **Fixer** or secondhand. Age 40; American; married. Worked on all kinds of spring needle work, also latch to a good extent. Gauze underwear, rubber lining, cuff knitting and ribbed hosiery.

1865 **Machinist and Fixer.** Has had eight years' experience. 24 years old; English; single. Is thoroughly familiar with Singer, Wheeler & Wilson, Merrow, Union Special, Lamb, Pepper, and Hepworth and Beattie loopers.

1873 **Master Mechanic** in cotton corporation. Has had large experience. Middle aged; strictly temperate. A graduate of a technical school. Learned carpenter's trade and machinist's.

1704 **Boss Dyer.** Age 36; English; single. Is familiar with dyeing cotton yarn and warp both for bleaching, fulling and other purposes. Has dyed for the best firms in England, also for export work.

1684 **Dyer.** Age 30. Been in business 12 years. Wants position at once. Will go anywhere. Is familiar with long chain, short skein and raw stock dyeing, and carpet warp.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1765 **Overseer Cloth Room,** white or colored. Age 48; American. 25 years' experience as secondhand.

WANTED MACHINE FIXER.

Prefer a German who understands Lamb or Grosser Machines, a young man who desires to become superintendent of knitting department. Western mill. Address FOXER, care Textile World.

WANTED LADY OVERSEER,

Who can handle female help, one prefered who understands the making of Lamb knit underwear. Address Lady Overseer, care Textile World.

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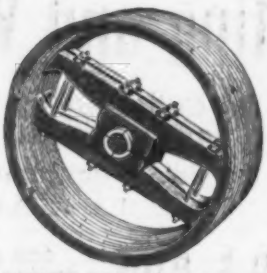

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1 set woolen mill in Ohio. Frame building with good stone basement, excellent water and steam power, with good dye house and fixtures attached; also, office and wool house separate. Six acres of land. Situated on C. A. and C. R. R., in a very good wool growing section, with a good wholesale and retail trade Will sell cheap or exchange for land. Reason for selling: am lone-handed, and having recently met with a serious accident, will be unable to look after the mill as formerly.

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The black is inexpensive, non-poisonous, color always uniform, will not crock, fine shade blue black or jet black produced as desired without extra cost.
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Best, safest, quickest and finest black in the world.
Note—I give gratis to any purchasers of the dye formula with lisle thread finish (patents applied for) a license for my latest improved oxidizing machines (patents applied for) that does away with all belting and pulleys.

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" No. 4—A black equal to the best of other Dyers 1.50 per 100 lbs.

I guarantee all the above in every particular, or no money. Address Direct

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Knits plain ladies' fashioned hose or half hose.
Our new machine runs with one belt. Has automatic tension device in the leg, heel and toe.
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HENRY KNAUSE, Prop., Hamburg, Pa. Satisfaction guaranteed.

FAST BLACK ON RAW COTTON

That does not bleed into white, can be had by dyeing with my

DIRECT BLACK J. EXTRA and developing and fixing with **DIAZOL** (Trade Mark Registered.)

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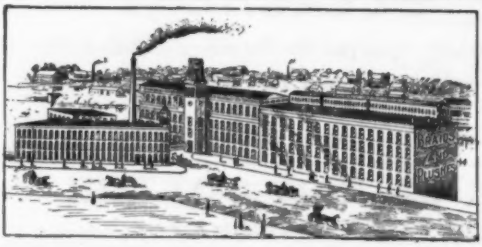

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Mohair and Worsted

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Mohair Plushes,

Worsted and Cotton Braids.

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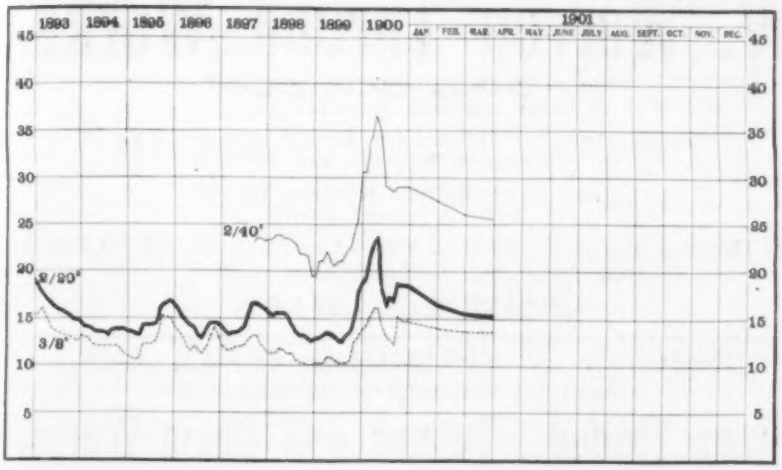
YARN DEPARTMENT.



Cotton Yarn.

Prices have declined during March, under pressure of heavy stocks of yarn and the unsatisfactory condition of the goods market.

The business transacted has been of a "from hand to mouth" character. Orders for yarn are usually accompanied with the request for immediate delivery, showing that the weavers and knitters lack confidence either in prices or in the future of the goods market. This tendency to do business with small stocks of goods extends to dealers in the manufactured goods as well; it throws back the burden of carrying stock toward first hands, and, as each fellow in turn seeks to relieve himself, the effect is to finally depress the raw material; this has already occurred, as shown by the marked decline in the staple.

The extensive curtailment of production which has taken place in the South, and to a somewhat less extent in the North, will exert a beneficial influence on values.

Prices are very irregular and it is difficult to quote them definitely. On such grades and sizes as are in stock, buyers find it easy to obtain desired concessions, while spinners offer a strong resistance to any marked reduction on yarns which are yet to be spun. We quote as follows:

Warps:—

14/1	13½ to 14
16s	14 to 14¼
20/1	14½
22/1	15
14/2	14½
20/2	15
30/2	16 to 16½

Skein:—

9/4 slack,	13½
16/3 slack	14
8/3 carpet	13
20/2	14½ to 15
30/2	15½ to 16

Philadelphia Yarn Market.

It is hard to determine what is market price for any yarn today. There is a variation in different mills, of 1c. to 1½c., in about the same quality, in certain numbers. Probably no yarn can be sold at a profit to spinners, at the present time. Such conditions must be temporary, however, as spinners could not continue to work on this basis. We quote as follows:

Southern Hosiery Cones:—

6s to 8s	14
10s	14½ to 15½
14s and 16s	15½
18s	16 to 16½
20s	16½ to 17
24s	17½ to 18½
30s	18½ to 19
40s	26 to 28
50s	35 to 36

The low prices, however, are bring-

W. Warren Thread Works,

SPOOL COTTON
on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use
on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns
on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

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GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

INCORPORATED 1884.

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For the Manufacturing Trade.

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BARNESVILLE MFG. CO.

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HOSIERY AND UNDERWEAR YARNS,
Peeler, Bleached, Egyptian or any colors desired. Also,

FINISHERS AND BLEACHERS
of piece goods, underwear, towels, yarns, etc.

THE ONLY USERS OF JACKSON'S FORMULA OXIDIZED BLACK FOR HOSIERY.

We solicit your patronage. Work Guaranteed.

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Manufacturers of - - - -

COTTON WARPS AND YARNS
In gray and all colors, single or in any twist.

NOVELTY YARNS
In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.

We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.

Carded and Colored Cotton for Mixing With Wool

Machined, or in Roving.

ing out more business, in some lines, so that stocks have been depleted to some extent. The shut down of the mills has also had some effect, which will probably be noted later in prices.

Woolen Yarn.

Spinners are getting more orders and it looks as though within the next month there would be a marked improvement in trade. This has been a season of procrastination—mills have been delaying orders, but a change has at last taken place, and buyers are placing orders with more or less timidity; there has, however, been a substantial gain and where orders a short time ago were not forthcoming at any price, today they have been placed by both weavers and knitters.

The cloaking trade has taken on some life and are having considerable yarn spun. The hosiery manufacturers are buying yarn for immediate delivery and some for future delivery. The best trade is buying yarn for future delivery, taking advantage of the low price of wool. The cheaper grades of hosiery are having a ready sale. Those who wait are liable to find later that the best spinners have all their machinery contracted for.

Knitters of underwear are also placing orders for delivery which will begin in May or June. They say in some lines that they have more orders this year than they had last, although orders have been very much delayed, and there has been very little buying until within the last two or three weeks.

The clothing end of the business is waiting until weavers are through making new styles, and quoting new prices; the price of cloth is low enough, and clothiers can work cloth and make money, but are anxious to get in at the lowest price.

The cutting of prices on fleece lined underwear has also much retarded the placing of orders. The buyers of fleece lined underwear are also buyers of all wool lines and they thought that, if fleece lined could be

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Fine Yarns, For Electrical Purposes

All Numbers 4 to 200.

From
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Entire product sold direct to consumers through the Company's own offices.

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COMBED OR CARDED

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AMERICAN MOISTENING COMPANY,

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The "Drosophore" and "Vortex" Humidifiers.

Over 20.000 of our HUMIDIFIERS in operation.

Highest award on the Recommendation of The FRANKLIN INSTITUTE for

"SIMPLICITY and ORIGINALITY of DESIGN"

DANA WARP MILLS

Westbrook, Maine.

WHITE AND COLORED WARPS,

6s to 50s—Single and Ply.

MULE COPS,

from 30s to 50s from

AMERICAN AND EGYPTIAN COTTON.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

Manufacturers of

Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS

Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL WORSTED, MOHAIR AND SILK.

Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

cut in price that the other lines would work likewise.

Buyers intended and expected to pay $3.75 per doz. for fleece lined garments, but manufacturers themselves broke the price until the price got down to $3.50 per doz., and the manufacturers who sold first at $3.75 got all their orders cancelled, and it has left them in a bad position.

These garments were first sold for $6.50 per doz.—today $3.50 per doz. is the price. They are making the garment so poorly that the buyer is getting just what he pays for, and this grade is about played out; this season will see the end of this garment.

Hosiery and underwear manufacturers state that stocks are much reduced, as there has practically been no buying since September. Manufacturers state that the stocks of goods are low. They can tell this by the sizes which are ordered from time to time. The result is that within six or eight weeks manufacturers will be obliged to order in quantity, and business will be again in a healthy condition. In the meantime, spinners are getting orders which will gradually fill them up and start the wheels going.

Worsted Yarn.

Spinners are working hard to secure orders; some orders have been placed for yarn at low prices. The one bright spot in the manufacturing business is the demand for worsted yarn for dress goods. Manufacturers of dress goods are busy and sales are large for yarn for this purpose, mostly in ¼ blood to ½ blood.

This cloth has a smooth effect and is made from worsted warp and wool filling. Bringing out new lines of samples will soon end, as it is getting so late that clothiers must soon place orders.

All the larger mills have been extensive buyers of worsted wool, and some large lines have been sold at low prices. This shows that the

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FANCY HOSIERY YARNS
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COMBED AND CARDED COTTON.
YARNS 40s and above. AND
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LINEN YARN IMPORTER.
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Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished

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SILKINE Also LISLE SILK FINISH
For Hosiery, Knit Goods, Yarn, Fast Black and Bleached Goods.
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HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

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ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns — white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS — of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

...Dyers of Yarn and Slubbing...

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FRENCH SYSTEM. BRADFORD SYSTEM

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MANUFACTURERS OF

Worsted and Woolen Yarns

OFFICE AND MILL: Delaware and Cooper Streets. CAMDEN, N. J.

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COTTON, WOOLEN, **YARNS AND BRAIDS** WORSTED. SPUN SILK.

PROVIDENCE, R. I.

DAN'L MASON,

Voorhis Mills, PATERSON, N. J.

BUYS JOB LOTS in colored and raw SILK YARNS.

Cash Advances on Sales and Prompt Returns.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

larger mills are securing orders. The small mills will soon follow suit.

It must be acknowledged, however, that many of the men's wear mills have not yet sold up, and this is particularly true of mills selling direct to the large clothiers. The trade seems to be getting nearer the time when cloth is needed for actual consumption and the clothiers are waiting as long as possible before placing orders.

The trade has not yet developed except on certain lines, and some mills have orders while others have no orders. Much cheviot yarn will be used and the undressed worsted effects are selling against all other lines. Some fine yarn is being sold, but mills running this grade have but comparatively few orders and which will not last more than until May 1st at latest.

Mixes are having a good sale and at good prices. 2/40's Australian is selling as low as 90 cents per pound. On the other hand, some mills manufacturing clay worsteds are sold up.

The French yarn spinners are getting but few orders and these are placed at low prices. There is great complaint among hosiery manufacturers using these yarns that prices are not satisfactory.

The sizes used in this branch of the industry range from 1/18 to 1/28 to 1/40's. We note that some spinners who sold yarn at much higher prices early in the season are voluntarily reducing prices to the present basis of value which is a considerable reduction from the price first contracted.

Manufacturers believe that now is the right time to purchase, but are holding off because some have much yarn bought, and do not care to contract further as buyers are not ordering nearly as fast now as will be the case later. We think we may safely say that but few users of hosiery

J. S. DODDS,
517 Wool Exchange, New York, N. Y.

MERCERIZED YARNS
Two and Three Ply, for All Purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.
Through H. A. CAESAR & CO.

EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Mercerized, Turkey Red, Gassed } Cotton Yarns.
Jacquard and Harness Twines.

Buckingham, Paulson & Co.,
COMMISSION MERCHANTS.
COTTON YARNS of all Descriptions.
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120 Chestnut Street, Phila. 530 5th Ave., Chicago, Ills.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

E. JENCKES MFG. CO.
Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.
PAWTUCKET, - R. I.

DEXTER YARN CO.
Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.
PAWTUCKET, - R. I.

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Spinners of
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WILLIAM B. CHARLES,
Cotton Yarns, Cotton Cloth, Silesia, Sateens
for the Underwear Trade.
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MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
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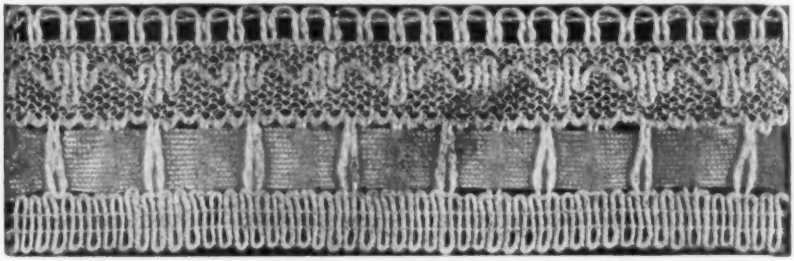

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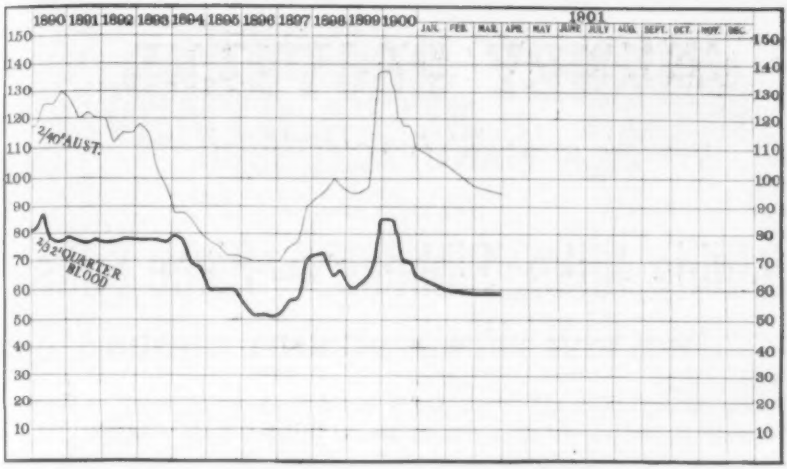

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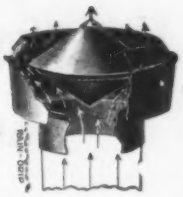

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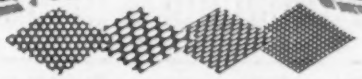

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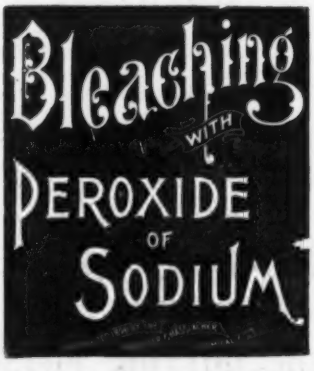

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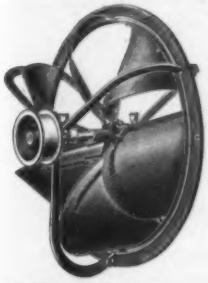

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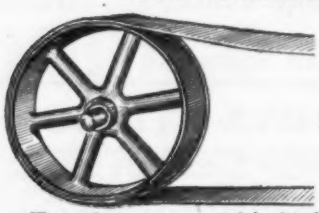

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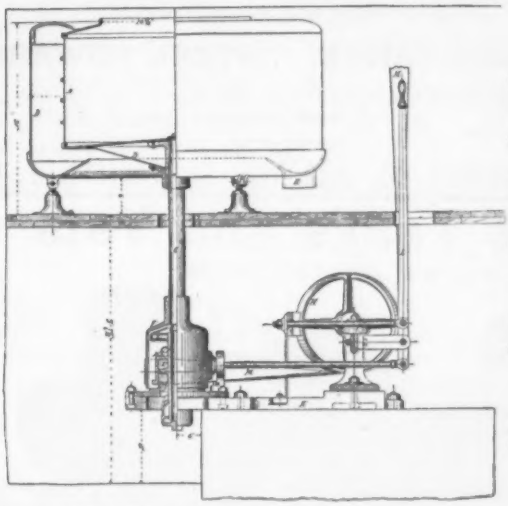

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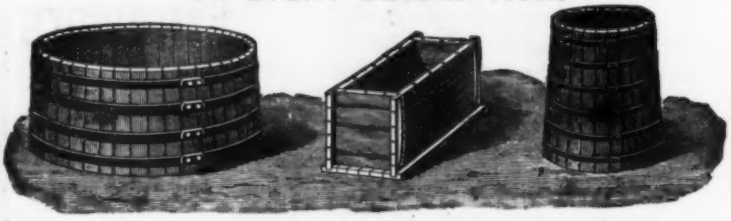

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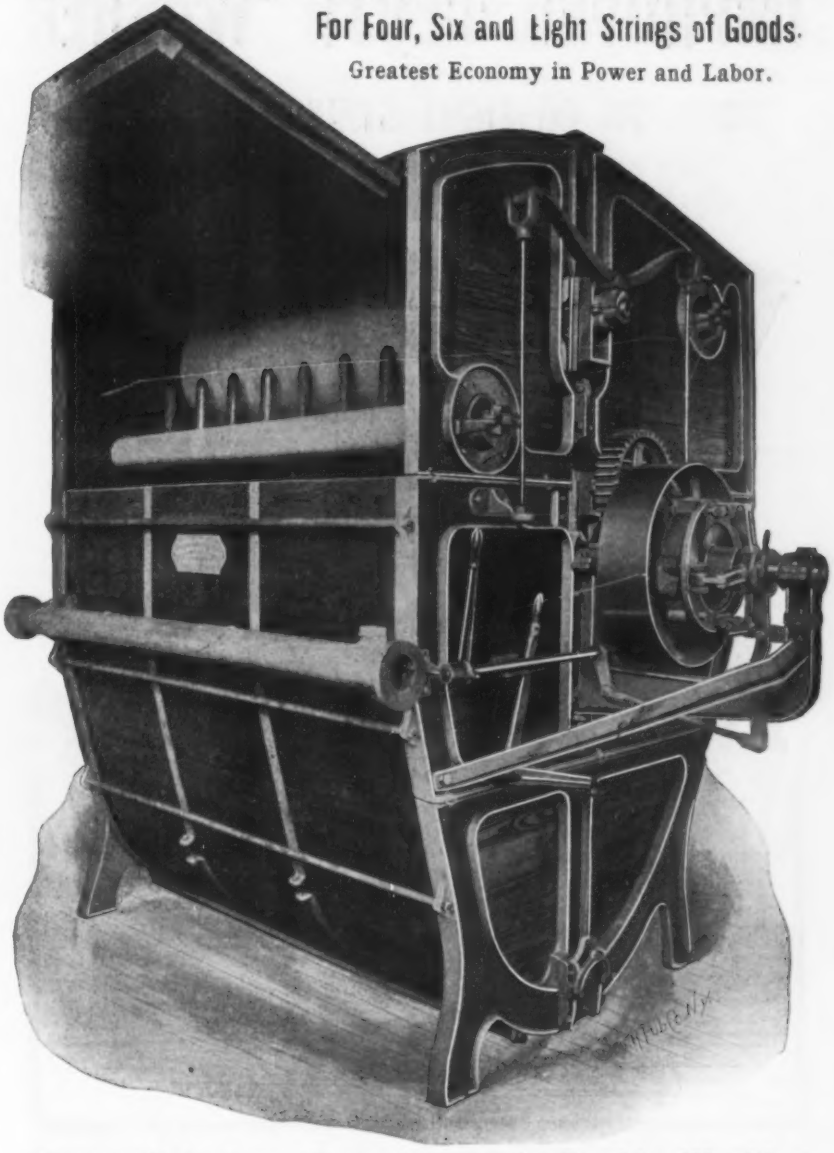

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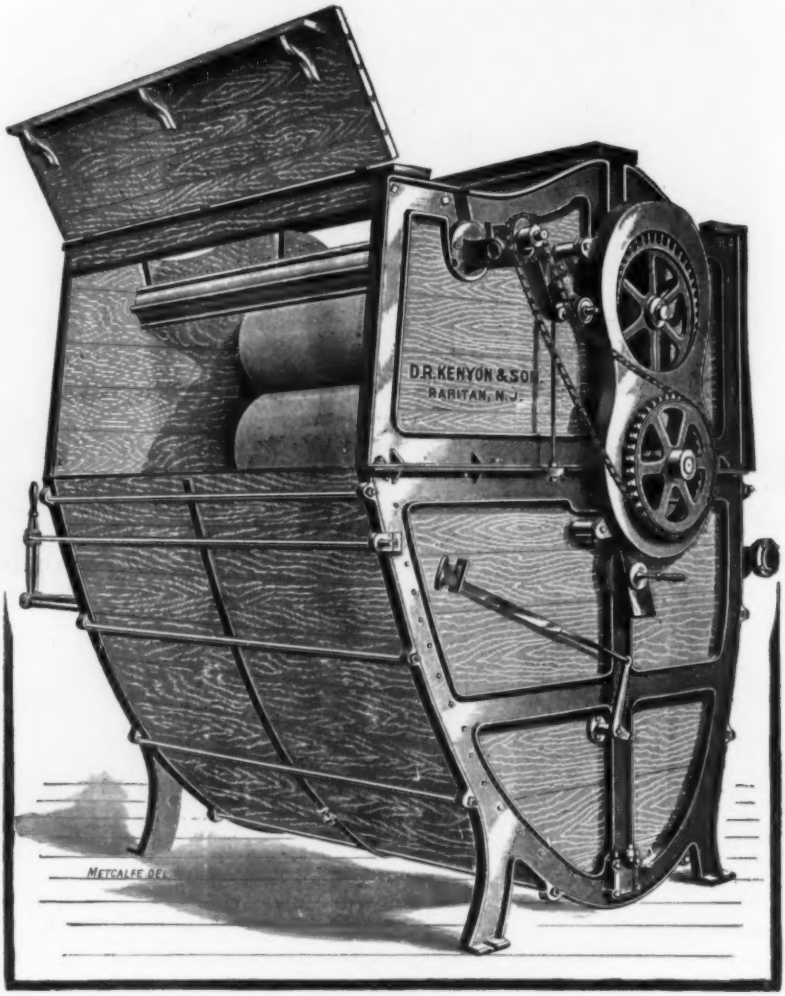

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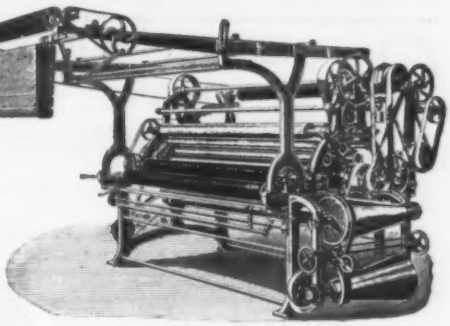

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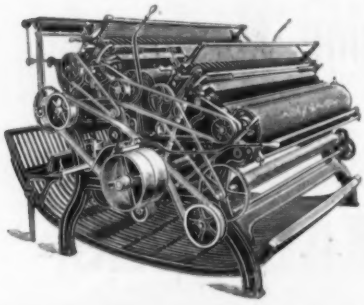

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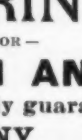

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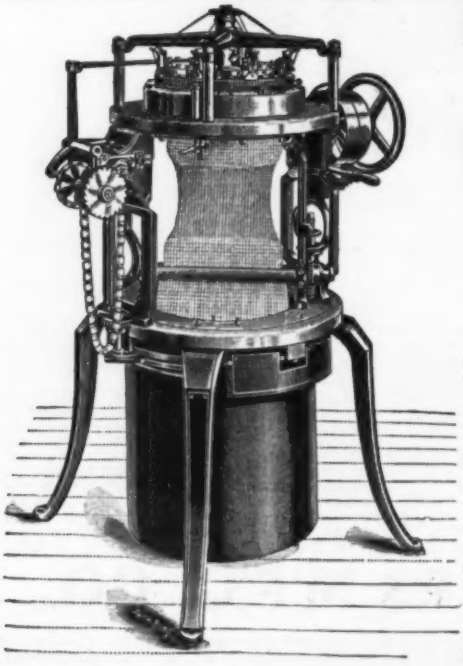

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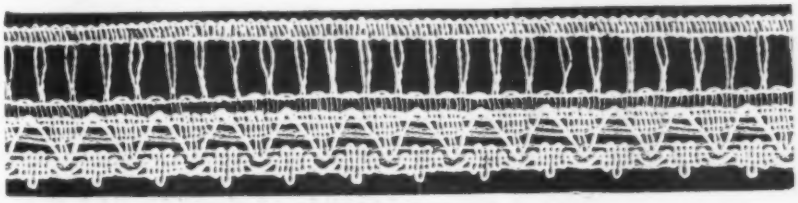

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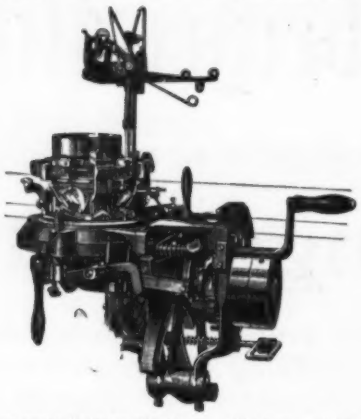

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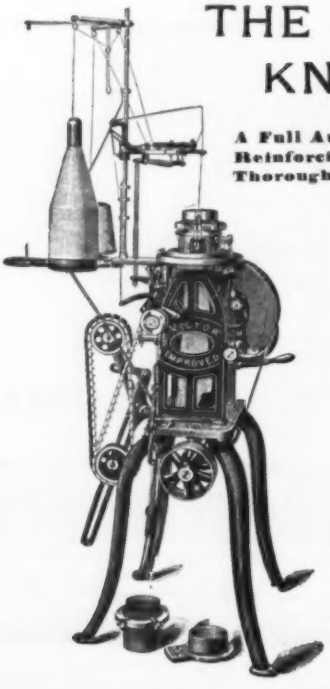

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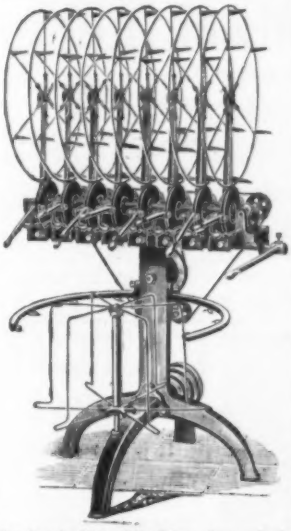

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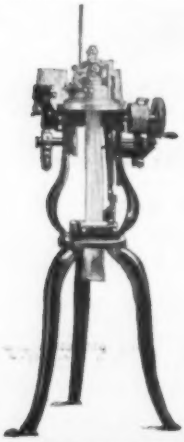

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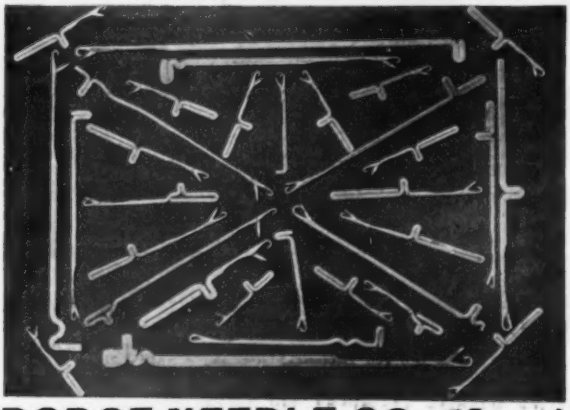

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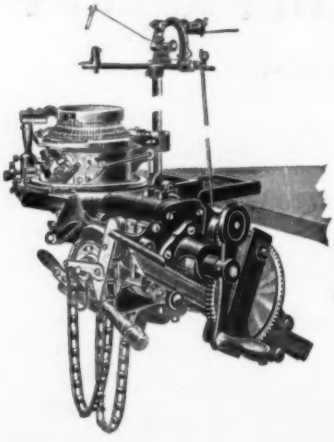

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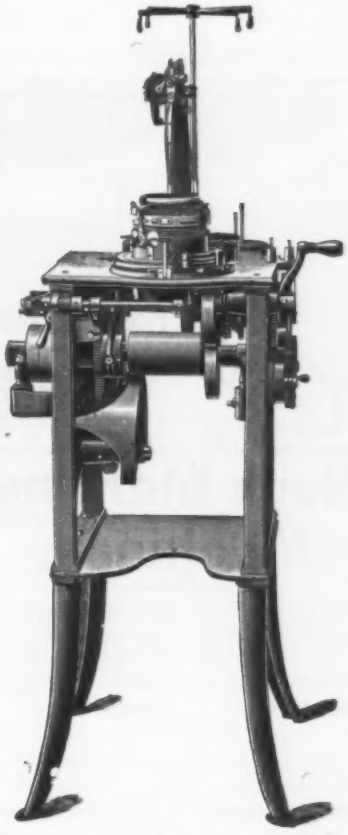

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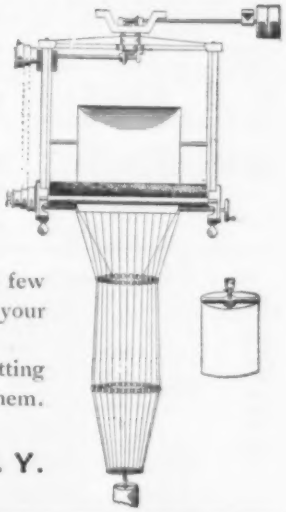

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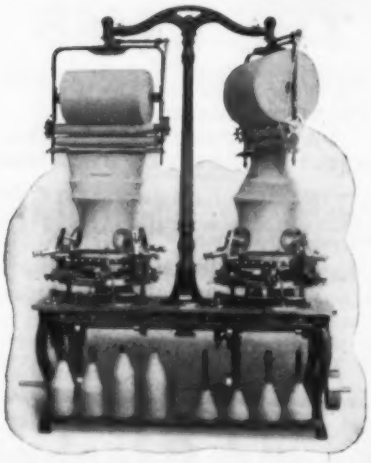

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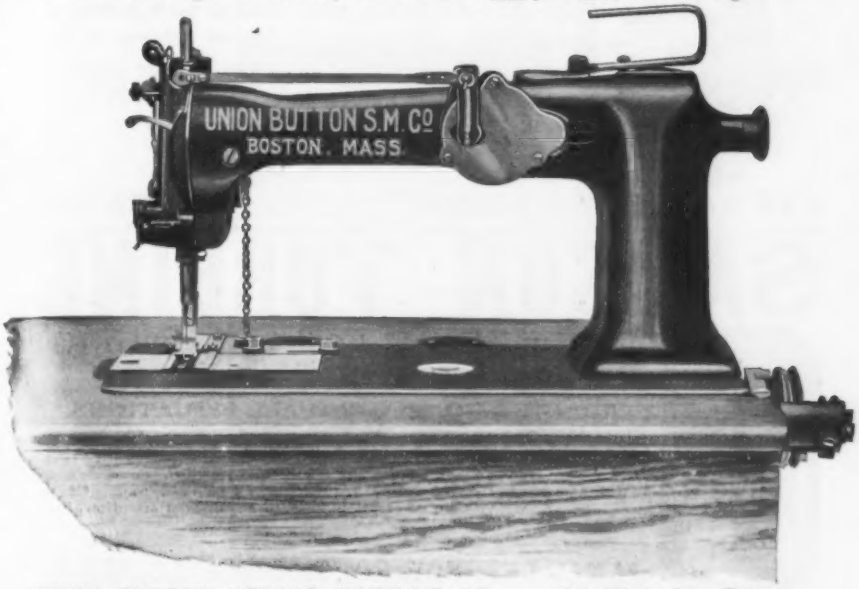

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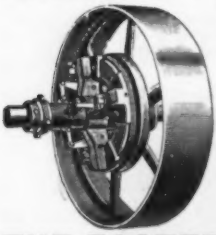

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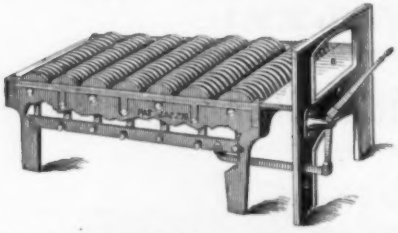

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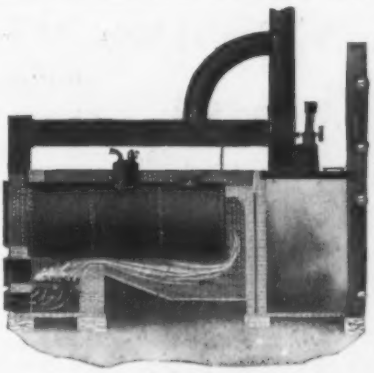

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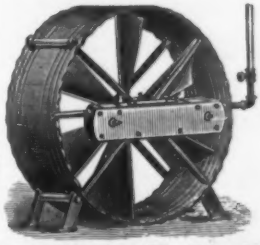

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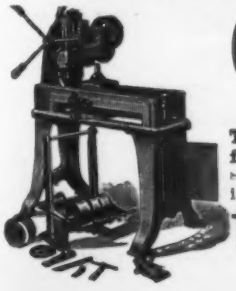

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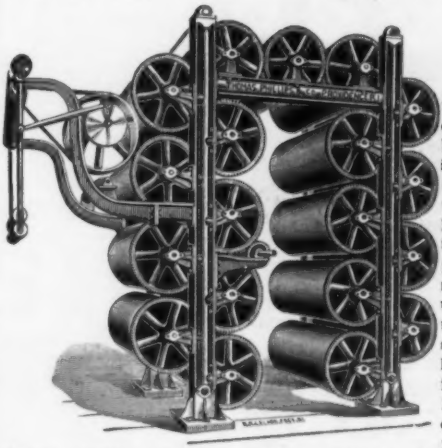

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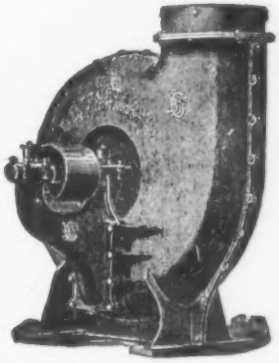

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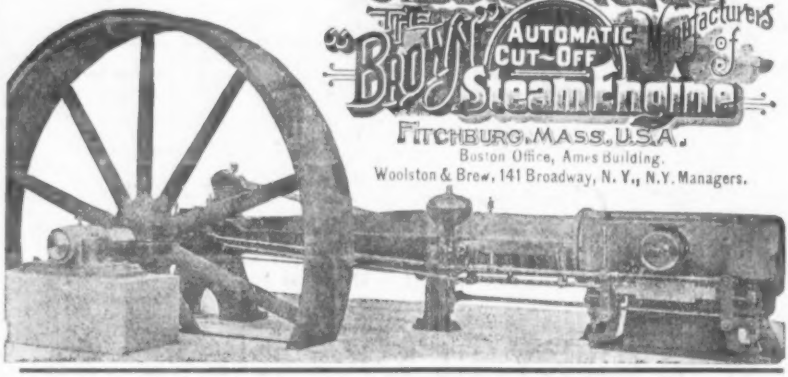

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